IT CORPORATION

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INSTALLATION RESTORATION PROGRAM

Final
Long-Term Groundwater Monitoring
October 1998 Report

Wright-Patterson Air Force Base
Long-Term Monitoring Program

Wright-Patterson Air Force Base
88th Air Base Wing
Office of Environmental Management

STRENGTH THROUGH SUPPORT

PROTECT RESTORE ENHANCE
Environmental Management
Wright-Patterson AFB

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September 8, 1999

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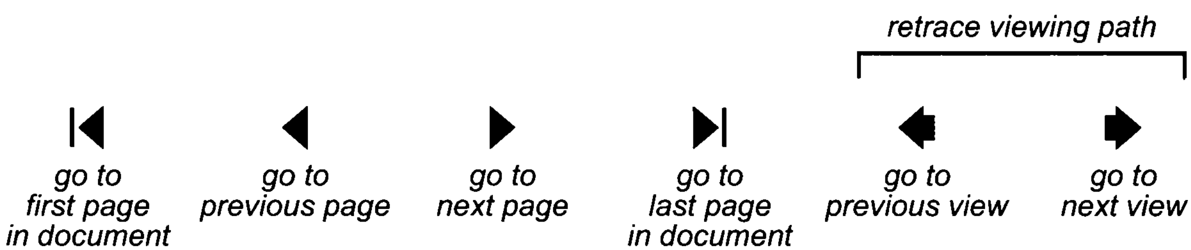

FINAL

LONG-TERM GROUNDWATER MONITORING

REPORT: OCTOBER 1998

LONG-TERM MONITORING PROGRAM

Submitted to:

Wright-Patterson Air Force Base
88th Air Base Wing
Office of Environmental Management
Wright-Patterson Air Force Base, Ohio

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List of Acronyms

BMP	Basewide Monitoring Plan
BS	Burial Site
CDA	Chemical Disposal Area
CGI	combustible gas indicator
COC	Chain-of-Custody
COPCs	contaminants of potential concern
DDA	Drum Staging/Disposal Area
EE/CA	Engineering Evaluation/Cost Analysis
EFDZs	Earthfill Disposal Zones
EOD	explosive ordnance disposal
FAA-B	Further Action Area-B
FPs	Field Procedures
FTA	Fire Training Area
GBT	gas barrier trench
GLTS	Gravel Lake Tank Site
GWOU	Groundwater Operable Unit
HP	Heating Plant
LEL	lower explosive limit
LF	Landfill
LFG	landfill gas
LF5	Landfill 5
LTM	long-term monitoring
MCLs	Maximum Contaminant Levels
OEPA	Ohio Environmental Protection Agency
OSL	off-site laboratory
OU4	Operable Unit 4
OU	operable unit
PID	photoionization detector
PRG	Preliminary Remediation Goal
PVC	polyvinylchloride
PWP	Project Work Plan
QA	quality assurance
QC	quality control
RI	remedial investigation
ROD	Record of Decision
SCOU	Source Control Operable Unit
SIs	Site Investigations
SP	Spill Site
TCLP	Toxicity Characteristic Leaching procedure
UEL	upper explosive limit
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
WPAFB	Wright-Patterson Air Force Base

1.0 Introduction

This document presents the results of the October 1998 long-term monitoring (LTM) event at Wright-Patterson Air Force Base (WPAFB). This environmental LTM sampling event consists of the following ongoing tasks:

- First round of the Basewide LTM program for groundwater removal actions;

- Continued Record of Decision (ROD) monitoring at Landfills 8 and 10 [Operable Unit (OU) 1];

- Continued Operation and Maintenance monitoring at Landfills 3, 4, 6, and 7 (OU4);

- Hydraulic containment monitoring at Landfill 5 (OU5); and

- Continued ROD monitoring at Spill Sites 2, 3, and 10 (OU2).

Each chapter contains a discussion of the various tasks including the methods of data collection, variances from approved procedures based on field-conditions, results of sampling, and an evaluation of the results.

While each of the above tasks is presented in a stand-alone chapter so that it can be extracted from the compendium, all groundwater monitoring tasks are ultimately evaluated together under the Groundwater Operable Unit (GWOU) for all of WPAFB (Chapter 7.0). The GWOU was established under the Basewide Monitoring Plan (BMP) to provide a comprehensive method for monitoring and evaluating the individual source areas (OUs), plume migration and the natural attenuation of contaminants.

With the exception of the continuing long-term natural attenuation monitoring at OU2, the monitoring tasks originally implemented individually under the BMP are now conducted collectively under the Basewide LTM program. However, beginning with the April 1999 sampling event, OU2 will be included in the Basewide LTM program.

1.1 Purpose and Objectives

The tasks of the LTM program are performed in accordance with a number of individual sampling programs being conducted concurrently at the Base. These sampling programs include:

- *Groundwater monitoring at OU1.* Groundwater monitoring at OU1 is being conducted under the Record of Decision (ROD) Source Control Operable Unit (SCOU) - Landfills 8 and 10 (WPAFB, 1993) in accordance with the Final Operation and Maintenance Plan (Kelchner, 1997).

- *Gas explosive monitoring at OU1.* Gas explosive monitoring at OU1 is being conducted under the OU1 ROD in accordance with the Final Operation and Maintenance Plan-Part 4 (Kelchner, 1997).

- *Hydraulic containment monitoring at OU1.* Hydraulic containment monitoring at OU1 is being conducted under the OU1 ROD in accordance with the Final Operation and Maintenance Plan (Kelchner, 1997).

- *Hydraulic containment monitoring at OU5.* Hydraulic containment monitoring at OU5 is being conducted in accordance with the OU5 System Performance Monitoring Plan (IT, 1992).

- *Methane monitoring at OU4.* Wells at OU4 are monitored for methane in accordance with the OU4 Landfill Gas Monitoring Technical Memorandum (CH2M HILL, 1998).

- *Groundwater monitoring for the Groundwater Operable Unit (GWOU).* Groundwater sampling for the GWOU is being conducted in accordance with the recommendations presented in the Draft BMP Engineering Evaluation/Cost Analysis (EE/CA), Appendix A: BMP Groundwater Monitoring Plan (IT, 1998).

- *Groundwater monitoring at OU2.* Groundwater monitoring at OU2 is being conducted in accordance with the Record of Decision (ROD) for Spill Sites 2, 3, and 10 within OU2 (WPAFB, 1997).

Data collected as part of the LTM will form a data set to be used to evaluate the trends in the organic and inorganic chemicals of potential concern (COPCs) in groundwater and evaluate the progress of ongoing remedial actions throughout WPAFB. Specific objectives of the LTM program are:

- Provide data to monitor past detections of inorganic COPCs above the Maximum Contaminant Levels (MCLs) at WPAFB that do not appear to form congruent contaminant plumes.

- Provide data to monitor areas of WPAFB where groundwater concentrations of volatile organic compounds (VOCs) exceed MCLs.

- Provide monitoring data in accordance with the recommended action for Further Action Area-B (FAA-B) (vinyl chloride site adjacent to the drum storage facility (Building 92, Area B) and east of Spill Site 11) to evaluate 1998 conditions. Sampling will be conducted annually until the pilot study is implemented.

- Provide monitoring to verify the progress of ongoing remedial efforts in accordance with the RODs at OU1 and OU2.

- Provide methane monitoring at OU4 to evaluate the progress of the selected remedy in accordance with the OU4 Landfill Gas Monitoring Technical Memorandum (CH2M HILL, 1998).

- Provide groundwater elevation monitoring downgradient of OU5 to evaluate the horizontal and vertical groundwater flow and capture zones and, ultimately, the effectiveness of the extraction system.

1.2 WPAFB Location

WPAFB is located in southwestern Ohio between the cities of Dayton and Fairborn and occupies portions of Greene and Montgomery Counties (Figure 1-1). WPAFB is subdivided into three areas: A, B, and C. The installation was formed as a consolidation of two bases: Wright Field (Area B) and Patterson Field (Areas A and C). Area B is separated from Areas A and C by State Route 444 and the ConRail Corporation railroad tracks. Area B encompasses approximately 2,800 acres and Areas A and C encompasses approximately 5,711 acres.

1.3 GWOU Background Information

WPAFB has grouped all confirmed or suspected sites requiring investigation and characterization into 11 geographically-based source operable units (designated OUs 1 through 11) and one groundwater operable unit (Figures 1-2 and 1-3). Groundwater, surface water, and sediment contaminants from each of the 11 OUs and groundwater contaminants that are not attributable to a known source on WPAFB are combined to form the GWOU for removal activities under the BMP. Because of groundwater movement patterns under WPAFB, contaminants from one source area (i.e., OU) may be transported through others, commingling contaminants and finally moving into remote portions of the Base. The BMP was established to evaluate this contaminant movement, assess risks posed to human health and the environment by exposure to the contaminants, and design a remedy for groundwater throughout the Base (IT, 1998).

The GWOU consists of groundwater, surface water, and sediment contaminants from each of the 11 OUs and groundwater contaminants that are not attributable to a known source on WPAFB. The GWOU is defined by three boundaries: an upper boundary consisting of the water table surface (including the vertical zone of seasonal water table fluctuations); a lower boundary where first occurrence of bedrock is at the base of the alluvial aquifer; and horizontal boundaries that are within the confines of WPAFB and areas effected by off-site migration of contaminants from WPAFB.

1.4 Basewide Monitoring Program

Numerous investigations have been undertaken relative to groundwater contamination at WPAFB. Table 2-1 of the *Draft-Final BMP Engineering Evaluation/Cost Analysis (EE/CA)* (IT, 1998) provides a synopsis of the environmental studies performed on the Base as a whole and those performed on specific OUs. Site investigations began in 1981 with a preliminary assessment/records search. Since that time, investigations and/or remedial actions have progressed at varying rates at the different OUs, depending on complexity, threat to human health and the environment, timing of identification of sites, and budgetary considerations. For example, remedial actions at Landfill (LF) 4 were undertaken in 1987, and capping of LFs 5, 8, and 10 have already been accomplished, while preliminary assessment of the recently identified Burial Site (BS) 5 and BS6 began only in 1996. Expanded discussions of the results of identified studies are available in other documents, which delineate the extent of contamination at the different OUs. As such, the contaminants of potential concern (COPCs), sources and likely pathways for contaminant migration are well-defined.

The primary conclusions of the basewide evaluation of organic COPCs are as follows:

- Although several areas currently exceed an organic COPC MCL, only four areas (OU1, OU2, FAA-A, and FAA-B) exceed both an MCL and a cumulative cancer risk of 1×10^{-4} or a Hazard Index of 1.

- After 30 years only OU1, FAA-A and FAA-B will exceed the organic COPC cancer risk of 1×10^{-4}.

- After 60 years all areas will be below the organic COPC cancer risk of 1×10^{-4}.

- Within 30 years the noncancer hazard will be below 1 for all areas.

The *Draft BMP EE/CA* was prepared for the proposed groundwater removal actions under the BMP. The EE/CA evaluated reasonable removal action alternatives for the GWOU that will provide protection of human health and environment by mitigating groundwater contamination. Chapter 3 of the *Draft BMP EE/CA* describes the source control measures currently in effect or planned for each OU and the groundwater extraction and treatment systems currently operating. Based on a comparative evaluation of the alternatives presented in the *Draft BMP EE/CA*, the following actions were recommended:

- For Area A, FAA-A, continue current groundwater treatment, discharge to surface water, monitoring, and restrictive regulations. As part of the EE/CA, removal action objectives were identified and removal action alternatives were evaluated for FAA-A. Of the four alternatives evaluated, Alternative A4, in-situ treatment via chemical oxidation in the vicinity of EW-1, has the potential to significantly reduce the time necessary to achieve the remedial action objectives. Currently, a Treatability Study including a chemical oxidation pilot-test at EW-1 is being considered.

- For Area B, FAA-B, in-situ chemical oxidation if pilot-test supports effectiveness. Long-term monitoring would be implemented if in-situ chemical oxidation is not effective.

In addition to the alternatives presented for the two further action areas (Area A and Area B) presented above, long-term monitoring was recommended for other areas on-Base:

- Areas with existing remedies in place (OU1 and OU2);

- Areas that exceed MCLs for organic COPCs, but that do not exceed the target risk range;

- Areas that exceed a cumulative cancer risk of 1×10^{-4} or a hazard index of 1 for organic COPCs, but do not exceed MCLs; and

- Areas exceeding MCLs and background for inorganic COPCs.

Long-term monitoring of these areas will be conducted to: (1) confirm that the conclusions drawn in the EE/CA are valid; (2) ensure that appropriate actions can be implemented if monitoring indicates that organic COPCs are migrating; and (3) confirm that the stated remedial action objectives are met.

The initial round of sampling for the Basewide LTM was conducted in April 1998 under the BMP and is considered the GWOU baseline data set for VOCs and metals. Data from subsequent sampling rounds will be compared to the LTM baseline data to establish trends. Data from the baseline sampling event was presented in the *Long-Term Groundwater Monitoring Baseline Report* (IT, 1999). The wells selected for the baseline sampling were recommended in the Draft-Final EE/CA (IT, 1998) but excluded the wells that were being monitored under existing sampling programs associated with remedial actions in OU1, OU2, and OU5.

WPAFB has chosen to consolidate several basewide sampling programs that were occurring separately. The wells monitored in OU1 and OU5 were added to the Basewide LTM program beginning with the October 1998 sampling event. In addition, the original set of wells proposed in the Draft-Final EE/CA for the LTM baseline sampling was revised for the October 1998 sampling by deleting wells that had been damaged or were not representative of their investigation area, and by replacing those wells with existing wells in the vicinity that have historically had groundwater contaminant concentrations that exceeded an MCL. Currently, the semiannual monitoring at OU2, per the OU2 ROD, is being performed at the same time as the LTM program wells; however, these monitoring results are reported separately. Beginning with the April 1999 sampling event, the OU2 LTM data will be reported in the Basewide LTM program report in a stand-alone chapter.

1.5 Organization of the LTM October 1998 Report

Monitoring procedures, results, and data evaluation of the October 1998 Basewide LTM program sampling are presented in the following Chapters. Each chapter has been prepared in a stand-alone format so that it can be extracted from the compendium.

- Chapter 2 describes the annual ROD sampling at Landfills 8 and 10 (OU1). Activities conducted as part of the OU1 sampling effort include groundwater quality monitoring, gas explosive monitoring, and hydraulic containment monitoring. Included in this section is: an overview of the site, and previous monitoring activities (Sections 2.1 through 2.3); a description of groundwater sampling locations and procedures, and pump installation (Section 2.4); a summary of the sampling results (Section 2.5); a discussion of gas explosive monitoring procedures, variances, and results (Section 2.6); a description of hydraulic containment monitoring procedures, variances, and results (Section 2.7); an evaluation summary of the sampling and monitoring results (Section 2.8); and an evaluation of the performance of the OU1 remediation system (Section 2.9).

- Chapter 3 describes the hydraulic containment monitoring being conducted at OU5. The scope of work, overview of the site and previous activities are presented in Sections 3.1 through 3.3. Monitoring procedures, variances, and results are presented in Section 3.4; an evaluation of the data is presented in Section 3.5.

- Chapter 4 describes the landfill gas monitoring activities at OU4 and includes a summary of the scope of work and site description/history (Section 4.1 through 4.3), monitoring procedures (Section 4.4), and monitoring results (Section 4.5).

- Chapter 5 describes the installation of monitoring wells at OU4 for the GWOU LTM program. Included in this section is: an overview of the site and program objectives (Section 5.1); a summary of the drilling and sampling method and well construction (Section 5.2); a description of the site geology (Section 5.3); a discussion of the pump installation (Section 5.4); and overview of the groundwater sampling (Section 5.5). Chapter 6 describes the

GWOU (or BMP) LTM activities. Included in this section is: a summary of the scope of work, overview of the site, and previous investigation activities (Sections 6.1 through 6.3); a discussion of pump installation and micropurging (Section 6.4); a description of groundwater monitoring procedures and variances (Section 6.4); a presentation of the groundwater monitoring results (Section 6.5); and an evaluation of the sampling and monitoring results (Section 6.6).

- Chapter 7 presents a overview of all groundwater monitoring activities currently being conducted at WPAFB, including the LTM program described above and the LTM of the natural attenuation of petroleum hydrocarbons being conducted at OU2.

- Chapter 8 provides a list of the references used throughout the document.

- The appendixes include field documentation collected during LTM activities such as: groundwater sample collection forms (Appendix A); chain of custody forms (Appendix B); laboratory data summary sheets (Appendix C); and OU4 boring logs and well construction diagrams (Appendix D).

2.0 Annual Record of Decision (ROD) Sampling at Landfills 8 and 10 (OU1)

Chapter 2 presents the results of the October 1998 long-term groundwater monitoring for Operable Unit 1 (OU1) at WPAFB, Ohio.

2.1 Introduction

The Long-Term Monitoring (LTM) program was initiated at OU1 in accordance with the Record of Decision (ROD) for Source Control Operable Unit 1 - Landfills 8 and 10 (WPAFB, 1993) and the OU1 Final Operation and Maintenance Plan (Kelchner, 1997). The monitoring program includes annual compliance sampling of groundwater and quarterly compliance sampling of groundwater, explosive gas (methane), and groundwater levels. The objective of the groundwater sampling is to confirm that contaminants have not migrated beyond the extent detected during the remedial investigations and to determine whether analytical compliance levels set forth in the ROD have been achieved. The objective of the explosive gas monitoring is to determine whether the landfill gas collection and treatment system has established a capture zone that extends outside the landfill boundaries so that migration of explosive gas beyond the landfill boundaries is prevented. The objective of monitoring groundwater levels is to evaluate effectiveness of the leachate extraction system in providing hydraulic containment of the leachate and groundwater in the vicinity of the site (i.e, maintaining a capture zone to eliminate migration of leachate beyond the landfill boundaries). Overall, data collected as part of the OU1 LTM program will form a data set to be used to evaluate the progress of the ongoing remedial efforts at OU1 and determine whether the selected remedy identified in the ROD is protective of human health and the environment.

2.2 Site Location and Description

Landfills (LF) 8 and 10 comprise the first of eleven operable units identified at WPAFB. The landfills are located adjacent to the Woodland Hills Base housing area in the northeast corner of Area B on WPAFB (Figure 2-1). Additional private homes are located along National Road, along the western boundary of Landfill 8. Landfill 10 is bounded by Kauffman Avenue to the north and Shields Avenue to the east. Landfill 8 is bounded by Dupont Way to the north and McClellan

Drive and National Road to the west. The landfills are approximately 1,000 feet apart; an unnamed tributary to Hebble Creek flows though the valley between the landfills (WPAFB, 1994).

LF8, encompassing approximately 11 acres, was operated from about 1947 until the early 1970s. This landfill received various municipal-type and hazardous wastes from Area B. There were four operational units at the landfill: general refuse disposal; toxic and hazardous chemical disposal; acid neutralization; and fire training activities north of Building 821. Materials were disposed in the landfill using trench-and-cover method. Depth of the trenches ranged from 6 to 44 feet. During its period of operation, approximately 36,000 gallons of chemical wastes were deposited in LF8. LF10, about 8 acres in size, was active from 1965 until the 1970s. The landfill received waste, including general refuse and hazardous waste, from all areas of WPAFB. As with LF8, materials were deposited in LF10 using trench-and-cover methods. Depth of the trenches ranged from 17 to 25 feet. General refuse reportedly deposited in both landfills contained oily wastes, solvents, organic and inorganic chemicals, and hospital wastes (Engineering Science, 1992b; WPAFB, 1993).

2.3 Site Background Information

A number of investigations were conducted at OU1 and are described in the *IRP Focused Remedial Investigation Report for Landfills 8 and 10 at WPAFB, Ohio* (WPAFB, 1992).

- A records search was conducted in 1981 (Engineering Science, 1982).

- A field investigation was conducted in 1984 (Weston, 1985). This investigation included the installation of monitoring wells and leachate/landfill gas monitoring wells. Surface water and groundwater were sampled; and geophysical surveys were performed.

- A follow-on field investigation was conducted in 1986 (Dames & Moore, 1986). This investigation included the installation of additional monitoring wells, groundwater sampling from the new and existing wells, drilling shallow soil borings to investigate the properties of the landfill covers, and monitoring leachate/landfill gas wells.

- An additional field study was conducted in 1989 (Weston, 1989). This study included re-sampling the groundwater monitoring wells, sampling leachate, and sampling surface waters and sediments along the unnamed tributary between LF 8 and 10.

- Three corollary investigation were conducted during the preliminary stage of the focused remedial investigation (RI): soil gas surveys (Engineering Science, 1990a), geophysical surveys (Engineering Science, 1992a; USEPA, 1990), and a combustible gas migration study (Engineering Science, 1991).

- A source control operable unit focused RI was conducted (Engineering Science, 1992b). In this investigation, soils, leachate, leachate seep sediment, groundwater, surface water, soil gas, and ambient air samples were collected on and in the vicinity of LFs 8 and 10. In addition, private wells from residence in the vicinity were also collected.

- An off-source OU RI was conducted (Engineering Science, 1993). This investigation included soil, groundwater, surface water and sediment sampling done off the landfills, landfill gas sampling from the leachate/landfill gas wells on the landfills, sampling for explosive gases in nearby homes, and ambient air sampling in the vicinity of the landfills.

During these investigations, a number of contaminants were detected in the media of concern such as dioxin, dibenzofurans, polychlorinated biphenyls, methane, various petroleum hydrocarbons (e.g., toluene, benzene), pesticides, and metals (IT, 1993). Based on information provided in the source control focused RI and focused feasibility study reports for the landfills, it was concluded that the landfills were sufficiently contaminated to warrant remediation. To protect public health, WPAFB, the Ohio Environmental Protection Agency (OEPA), and the U.S. Environmental Protection Agency (USEPA) identified Alternative number 3 of the ROD (close LFs 8 and 10) as the preferred remedy. Alternative 3 consists of the following components:

- Low Permeability Clay Cap.
- Leachate Collection and Treatment.
- Landfill Gas Collection and Treatment.
- Public Water Supply for Private Well Users.
- Operation and Maintenance and Performance Monitoring.
- Disposal of Nonhazardous Drill Cuttings under the Clay Cap.

The information presented in this report is the result of field work conducted as part of the Operation and Maintenance and Performance Monitoring. Monitoring procedures and results are presented in the sections below.

2.4 OU1 Annual Remedial Action Groundwater Quality Monitoring

The annual groundwater sampling of the OU1 monitoring and extraction wells was conducted from October 19 through November 1, 1998. The field activities discussed in the following sections were conducted in accordance with the task SOW (WPAFB, 1998) and the Operation and Maintenance Plan for Landfills 8 and 10 (Kelchner, 1997). This section describes the pump installation, groundwater sampling, and sample handling procedures used during the October 1998 annual remedial action groundwater quality monitoring for OU1.

Figures 2-2 and 2-3 present the locations of the monitoring and extraction wells at Landfills 8 and 10, respectively. Table A-1 of the Engineering Evaluation/Cost Analysis (EE/CA) for the Groundwater Basewide Monitoring Program (BMP) (IT, 1998) is presented in Appendix A and lists the sampling frequency and sampling months of the OU1 wells. Annual samples collected from monitoring and extraction wells were analyzed for the parameters presented in Table 2-1.

2.4.1 Groundwater Sampling Procedures: Monitoring Wells

For the October 1998 annual sampling event, OU1 groundwater monitoring wells were purged and sampled using micropurge low flow-rate techniques in place of the three-volume method presented in Field Procedures (FPs) 5-6 and 6-5. Micropurging will be used in all future sampling events because the low flow rates that are required to maintain a constant dynamic water level draw water from directly within the screened interval of the well where the pump inlet is positioned. This eliminates the purging of the entire stagnant water column and, therefore, generates a minimal amount of wastewater to be disposed of.

Monitoring wells were purged and sampled with dedicated bladder (pneumatic) pumps. The dedicated bladder pumps were either existing in the wells from prior sampling programs or were new pumps installed just prior to purging.

2.4.1.1 Pump Installation

Monitoring wells scheduled to be sampled as part of the OU1 annual sampling were configured to be purged and sampled using the micropurge method. Bladder pumps were installed in the groundwater monitoring wells in accordance with field procedure FP 5.2. The following general procedures were used for installation of the dedicated bladder pumps (see FP 5.2 for more detail):

- During the quarterly water level monitoring (Section 2.6) and prior to pump installation and sampling, monitoring wells were screened with a photoionization detector (PID) and a combustible gas indicator (CGI) to monitor for the presence of airborne VOCs and combustible gas. Wells were monitored with a PID again prior to pump installation and sampling.

- Plastic sheeting was placed on the ground around the well casing to contain the pump assembly and associated installation equipment and supplies.

- Wells were sounded for depth to static water level and total well depth.

- Total length of the pump and tubing assembly was determined to position the pump inlet approximately one foot above the bottom of the well and in the screened interval.

- Intake and discharge tubing were measured and cut to the proper length.

- Well caps and fittings were assembled to the end of the tubing.

- Pump and tubing assemblies were carefully lowered into the well.

- Well caps were positioned on the top of the riser casing.

All sampling pumps used to purge the wells are 1.66 inches in diameter and 44 inches in length. Pumps are constructed of stainless steel bodies with Teflon® internal bladders. The bladder pumps in the wells were positioned in the lower portion of the screened interval and pumped at sufficiently low flow rates to maintain water levels with only minimal drawdown.

2.4.1.2 Well Purging: Micropurge Pumping Method

In accordance with field procedure FP 5.2, prior to collecting groundwater samples, monitoring wells were purged with dedicated pneumatic pumps using the micropurge method to remove stagnant water in the well at the inlet to the pump.

During the quarterly water level monitoring (Section 2.6), background and wellhead air space at all well locations were screened with a PID and a CGI to monitor for the presence of airborne VOCs and combustible gas. Prior to sampling, monitoring wells were again screened with a PID. After VOC screening, static water levels were measured from the top of the inner casing to the nearest 0.01 foot and recorded. Monitoring wells were purged by the micropurge method in accordance with field procedure FP 5.2. With the micropurge method a minimum purge volume of two pump and two tubing volumes is required. Groundwater quality was considered representative of the surrounding geologic formation when the field parameters and the pumping water level in the well had stabilized as discussed below.

2.4.1.3 Well Purging: Bailing Method

Three monitoring wells (LF08-MW10C, LF10-MW05C and LF10-MW102) had insufficient water columns for the installation of a dedicated pumping system. These wells were bailed in accordance with field procedure FP 5-5 and Section 6.3.1 of the OU1 Final Operations and Maintenance Plan (Kelchner, 1997) using disposable Teflon® bailers. These wells were bailed dry and allowed to recover overnight for sampling the following morning.

2.4.1.4 Field Parameters

In accordance with FPs 5-5 and 5-6 (Well Purging-Bailing Method and Well Purging-Pumping Method) purge water was monitored in the field for the field parameters of temperature, pH, specific conductivity, dissolved oxygen, and turbidity using a Horiba U-10 water quality meter. Oxidation reduction potential was monitored using an Orion Model 250 portable meter. The meters were placed in a flow-through cell and measurements were collected every five minutes during purging until a set of three stabilized readings were obtained. Readings were considered stabilized when the physical and chemical parameters were within the following limits:

- pH was within ± 0.2 Standard Units
- Water temperature was consistent within ± 1 degree Celsius (°C)
- Specific conductance was consistent within ± 50 microSiemens per centimeter (μS/cm) for readings <500 μS/cm, or ± 10% for specific conductance >500 μS/cm.

If turbidity in a well still exceeded 25 NTUs (FP 5-4) after the above parameters were stabilized, pumping rates were lowered to the lowest possible rate and additional water was purged until the water cleared. A well was also considered to be sufficiently purged if it went dry during micropurging. These wells were then sampled when they were sufficiently recharged to collect a sample (FP 5-5, Section 8.4). The purge logs for sample collection are presented in Appendix B and the final parameters measured just prior to sampling are presented in Table 2-2.

Purge water was containerized, transported back to a central staging area and disposed of at the end of the sampling event by a certified treatment and disposal facility.

2.4.2 Extraction Well Sampling

Extraction wells at Landfills 8 and 10 are equipped with dedicated pneumatic pumping systems for leachate collection (Figure 2-4). Selected collection wells were sampled directly from a quick-connect adaptor fitted to the discharge line. The adaptor was decontaminated prior to the initial sample and also between each location. Samples were collected in accordance with the procedures presented in Section 6.3.2 of the OU1 Final Operations and Maintenance Plan (Kelchner, 1997) with the exception of purging one well volume prior to sampling from wells that had not cycled within 12 hours of sampling. For the extraction wells that produce water at frequent pumping cycles on a daily basis, well purging was not required and ample water was available for collecting sufficient sample volume. The remaining wells typically had not cycled within the 12 hour period prior to sampling and were either completely dry or did not have a sufficient volume of water to collect all analytical parameters. To conserve the available water from these wells, one well volume was not purged prior to sampling. When sufficient water was available, ending field parameters, as discussed in Section 2.4.1, were measured and recorded. Table 2-3 presents the ending field parameters for the extraction wells sampled at LFs 8 and 10.

An indicator of the pump cycling frequency is the QED® cycle totalizer fitted to each pumping system. Each cycle represents one-half gallon of water pumped from the well. A cycle is registered on the totalizer each time the air supply line to the pump is pressurized and discharged. If an attempt was made to sample an extraction well by manually operating the air supply line and cycling the pump and the well was dry, one cycle would register on the QED even if water was not pumped.

Purge water was containerized and transported back to the Leachate Treatment System for treatment and discharge into the City of Fairborn POTW via a sanitary sewer.

2.4.3 Sample Collection and Management

Immediately after purging, groundwater samples were collected following field procedure FP 6-5 using the same dedicated pumps or bailers. The analytical laboratory provided new, certified clean and prepreserved (volatile sample vials only) sample containers. Groundwater samples were analyzed for the parameters listed in Table 2-1. Sample preservation, containerization and holding time requirements are also presented in Table 2-1. Samples were collected in the following order; VOCs, dioxin\furan, semi-volatiles, pesticides\PCBs, and inorganics. To ensure that the dioxin\furans analysis was conducted for as many wells as possible, including wells with insufficient water volume for the full analytical suite, the 2-liters required were collected immediately after VOCs.

Groundwater samples were collected by filling each sample container directly from the Teflon®-lined discharge tubes. Samples for total metals, ammonia and cyanide analyses were field checked for the correct pH by pouring a small amount of sample out of the container onto pH paper. VOC samples were not checked for proper preservation to preserve the zero headspace of the filled VOC vials.

After collection, samples were placed on ice in a cooler and maintained at 4 degrees C until shipped to the laboratory. Generally, samples were shipped the day of collection; however, when sampling logistics did not allow shipment on the day of collection, samples were held overnight in a secured sample cooler for shipping the next day.

Samples were shipped by overnight carrier to the Quanterra laboratory located in North Canton, Ohio for analysis following methods specified in the SSWP.

2.4.4 Field Quality Control Samples

As a check on the quality of field activities (including sample collection, containerization, shipping, and handling), trip blanks, ambient blanks, and field duplicates were collected with specified frequencies following the PWP guidelines. The frequency with which these samples were taken, and number of such samples, are discussed below. In addition, quality assurance (QA)/ quality control (QC) requirements for field analyses are also discussed below. Sampling equipment was dedicated for each monitoring well, therefore, equipment rinsate samples were not required. Extraction wells however, required a sampling adaptor which was decontaminated between wells (Section 2.4.2). A rinsate sample from the adaptor was not collected during this round of sampling but future rounds will include a daily rinsate sample during extraction well sampling.

A trip blank is a sample bottle filled by the laboratory with analyte-free laboratory reagent water, transported to the site, handled like a sample but not opened, and returned to the laboratory for analysis. One trip blank consisting of two 40-ml vials was sent to the laboratory in the cooler containing all the segregated VOC samples. Trip blanks were analyzed for VOCs only.

An ambient field blank is water poured into a sample container at the sampling location, handled like a sample, and transported to the laboratory for analysis. The water sampled must be the same water used in any decontamination activities conducted on site. This water is normally organic-free deionized water. One ambient blank was collected during the sampling event for OSL analysis. Ambient blanks were analyzed for all target analytes.

A field duplicate is an additional sample collected independently at a sampling location during a single act of sampling. A duplicate sample is used to assess the representativeness of the sampling procedure. The minimum total number of field duplicates required for each analysis is equal to 10 percent of the samples collected.

The QA/QC program implemented in the field to ensure that valid data was obtained during sampling was in accordance with Section 9.0 of the Quality Assurance Project Plan, Volume 2 of the PWP (ES, 1991). The analytical QA/QC sampling protocol is summarized as follows:

QA/QC Sample Type	Frequency
Trip Blanks	1 per shipping day
Field Duplicates	1 every 10 samples
Ambient Blank	1 per sampling event
Matrix Spikes	1 every 20 samples
Matrix Spike Duplicates	1 every 20 samples

2.4.5 Sample Management

Groundwater samples collected for the OU1 annual remedial action groundwater quality monitoring were identified, preserved, and handled in accordance with Section 4.0 of Volume 1 and FP 6-12 of Volume 2, Appendix C of the Project Work Plan (ES, 1991).

Sample Identification

Each sample was designated with a unique sample number which identified the location and type of sample collected. The sample number format is as follows:

- Location Identification - The designation "WP-LF08 or LF10" = Wright-Patterson Air Force Base, Landfill 8 or 10.

- Monitoring Wells - Designated "MWxx" where "xx" indicates the well number. Well numbers ending in a letter (A, B or C) indicate depth (deep, intermediate and shallow).

- Extraction Wells - Designated "EW-08xx or EW-10xx" for extraction well number "xx" at either Landfill 8 or 10.

- Sample Media and Sample Number - An alpha-numeric code was used to identify the sample media and the sequence number of the sample. The following designator was used during this task: "GW##" (groundwater and sampling round). Note, for this round the number "10" was used as an arbitrary starting point for the initiation of the LTM program at OU1.

- Additional designators for QA/QC samples - Duplicate samples were identified with "5" following the sampling round number. For this round a duplicate sample would have the suffix "-GW105". Matrix Spike and Matrix Spike Duplicates had "MS" and "MS DUP", respectively, appended to the sample media and sample number designator.

- Trip blanks - Trip blanks were identified by "WP-xxyyzz-TB01", were "xxyyzz" represents the date the associated VOC samples were collected.

- Ambient blanks - Ambient blanks were identified by "WP-LFxx-MWyy-AMB01", were "LFxx-MWyy" represents the landfill well were the blank was collected.

An example of the complete identification for a groundwater matrix spike sample collected from monitoring well MW09A at Landfill 8 during this round of sampling would be as follows: WP-LF08-MW09A-GW10MS.

Sample Handling

Samples were handled in accordance with procedures in Section 5.11.3 of Volume 1 and FP 6-12 of Volume 2, Appendix C of the Project Work Plan. Sample numbers, descriptions and other pertinent information were entered into field logbooks by the Field Team Leaders. In addition, Chain-of-Custody (COC) records were completed for each sample. COC forms contain sample team members, sample numbers, date and time of collection, container types and volumes, preservatives and analytical parameters. COC forms are presented in Appendix C.

All samples were under direct control of the sampling team members or Site Coordinator until custody was transferred to the overnight freight carrier (FEDEX®). Samples were packaged for shipping by placing the bottles in coolers lined with two plastic trash bags with a bottom layer of vermiculite in between. Double-bagged raw ice packages were then placed between the bottles, with all bottles in contact with the ice. Each cooler was then taped shut and custody seals were attached along the cooler sides across the lid opening to ensure against tampering.

2.4.6 Leachate Discharge System Monitoring

For compliance with the conditions of City of Fairborn sewer discharge permit, one sample was collected from the discharge line of the Leachate Discharge System. The sample was collected by first purging an initial amount of water from the valve-operated tap in the discharge line to clear any stagnant water within the tap. A minimum purge volume was not required as the treatment system is in continuous operation. Purged water was collected and disposed of in the treatment system sump. After clearing the stagnant water, field parameters were measured and recorded just prior to sampling (Table 2-3). Samples were collected directly from the discharge line tap.

Samples from the leachate treatment system discharge are given a unique sample number with the following designation system: WPAFB-LF8/10-LW0x-yyyy. The "x" represents the quarter of the year in which the sample is being collected. The "yyyy" represents the current year at the time of sampling. Therefore, the sample number for the discharge compliance sample collected in October of 1998 is WPAFB-LF8/10-LW04-1998. Analytical parameters and sample management criteria are presented in Table 2-4.

In addition to reporting the treatment system discharge analytical data semiannually in the April and October reports, quarterly reports are submitted to the WPAFB project manager and to the City of Fairborn Water Projects Coordinator.

2.4.7 OU1 ROD Annual Groundwater and Leachate Sampling Results

The following sections present a summary of the analytical results from the October 1998 sampling event at LF 8 and LF 10. Concentrations of detected analytes were compared to compliance levels established in the *SCOU1 - Landfills 8 and 10 ROD* (WPAFB, 1993) for accedences. Compliance levels establish acceptable exposure levels that are protective of human health and the environment. As defined in the *SCOU1 - Landfills 8 and 10 ROD* (WPAFB, 1993), the analytical compliance levels for LFs 8 and 10 include the MCL and/or a ROD compliance level (i.e., a risk-based concentration level) for each COPC (Table 2-5).

Regulatory and detection limits for chemicals of concern at OU1 are presented in Table 2-5. The VOC detection limits for several extraction wells were above the normal limit of 0.5 μg/L. In all of these samples elevated levels of methylene chloride required a dilution of the original sample to obtain an accurate methylene chloride concentration and prevent damage to the mass spectrometer. Due to the elevated methylene chloride concentrations the increases in detection limits ranged from 20 μg/L (EW-0803) to 0.84 μg/L (EW-1019).

The sample detection limits for the dioxin 2,3,7,8 TCDD were above the ROD compliance level (5.67×10^{-7} μg/L) in all samples (Table 2-5). However, the MCL for 2,3,7,8 TCDD (3.00×10^{-5} μg/L) was exceeded in only two wells, LF10-MW05C (3.3×10^{-5} μg/L) and LF10-MW06A (3.1×10^{-5} μg/L). The detection limits in several samples also exceeded the ROD compliance level for 2,3,7,8 TCDF (5.67×10^{-6} μg/L). Due to the method used in analyzing for dioxin, detection limits could not be reported for a dioxin that was detected. Therefore, an "NA" on Table 2-5 indicates a that a value was not applicable or not available.

The only inorganic that had detection limits exceeding a regulatory level was beryllium. The detection limit for beryllium (5.0 μg/L) exceeded the ROD compliance level (0.02 μg/L) and the MCL (4.0 μg/L).

For future sampling events the laboratory will report the analytical results from the lowest possible dilution.

2.4.7.1 Landfill 8

Tables 2-6 through 2-15 present a summary of the October 1998 and the historic groundwater analytical data for each extraction and monitoring well at LF8; only the October 1998 results will be discussed in this report.

VOCs

During the October 1998 sampling event, VOC concentrations found exceeding MCLs included: benzene in well WP-EW-0803 (9.6 μg/L); and vinyl chloride in wells WP-EW-0816 (24 μg/L), WP-LF08-MW10B (10 μg/L), and WP-LF08-MW10C (4.4 μg/L). VOC concentrations exceeding the risk-based concentration levels (ROD compliance levels) included: benzene in wells WP-EW-0803 (9.6 μg/L), WP-EW-0816 (2.9 μg/L), WP-LF08-MW06B (0.75 μg/L), WP-LF08-MW09A (1.1 μg/L); methylene chloride in wells WP-EW-0803 (950 μg/L), WP-EW-0812 (420 μg/L), WP-EW-0816 (51μg/L); trans-1,2-dichloroethene (DCE) in wells WP-EW-0816 (2.2 μg/L) and WP-LF08-MW10C (0.22 μg/L); and vinyl chloride in wells WP-EW-8016 (24 μg/L), WP-LF08-MW10B (10 μg/L), and WP-LF08-MW10C (4.4 μg/L).

Figure 2-5 presents the detected concentrations of organic COPCs at LF8 (concentrations exceeding MCLs and/or ROD compliance levels are denoted in red).

SVOCs

With the exception of naphthalene in WP-EW-0803 (16 μg/L) and WP-LF08-MW102 (0.5 μg/L), no SVOCs listed as COPCs were detected in LF8 wells. There is no MCL or ROD compliance level established for naphthalene.

Dioxin/Pesticides/PCBs

During the October 1998 sampling event, no pesticides or PCBs listed as COPCs were detected in the wells at LF8. Concentrations of one furan and one dioxin were found to exceed the ROD compliance levels: 2,3,7,8-TCDF in WP-LF08-MW04C (5.7×10^{-6} μg/L) and 1, 2, 3, 4, 6, 7, 8, 9-OCDD in WP-LF08-MW101 (1.0×10^{-3} μg/L).

Inorganics

During the October 1998 sampling event, two inorganics were found to exceed MCLs and ROD compliance levels—arsenic and lead. Arsenic exceeded the MCL in two extraction wells, WP-EW-0812 (410 μg/L) and WP-EW-0816 (260 μg/L), and one monitoring well, WP-LF08-MW10C (110 μg/L). Arsenic was found to exceed the ROD compliance level, which is lower than the MCL, in the three wells where the MCL was exceeded and in six additional monitoring wells: WP-LF08-MW02C (14 μg/L), WP-LF08-MW04A (23 μg/L), WP-LF08-MW04B (18 μg/L), WP-LF08-MW06B (49 μg/L), WP-LF08-MW103 (13 μg/L), and WP-LF08-MW10A (25 μg/L). Lead concentrations exceeded the MCL in two monitoring wells: WP-LF08-MW101 (26 μg/L) and WP-LF08-MW10C (19 μg/L).

Figure 2-6 presents the detected concentrations of inorganic COPCs at LF8 (concentrations exceeding MCLs and/or ROD compliance levels are denoted in red).

2.4.7.2 Landfill 10

Tables 2-16 through 2-25 present a summary of the October 1998 and the historic groundwater analytical data for each extraction and monitoring well at LF10; only the October 1998 results will be summarized in this report.

VOCs

During the October 1998 sampling event, one VOC was found with a concentration exceeding the MCL: vinyl chloride in well WP-LF10-MW06B (4.2 μg/L). VOC concentrations exceeding the risk-based concentration levels (ROD compliance levels) included: benzene in wells WP-EW-1001 (1.6 μg/L), WP-EW-1012 (0.67 μg/L), WP-EW-1019 (1.5 μg/L), WP-LF10-MW09B (1.0 μg/L), WP-LF10-MW09C (3.2 μg/L), WP-LF10-MW103 (1.5 μg/L); methylene chloride in well WP-EW-1019 (45 μg/L); and vinyl chloride in wells WP-EW-1012 (0.69 μg/L) and WP-LF10-MW06B (4.2 μg/L).

Figure 2-7 presents the detected concentrations of organic COPCs at LF10 (concentrations exceeding MCLs and/or ROD compliance levels are denoted in red).

SVOCs

With the exception of naphthalene in WP-EW-1001 (0.86 μg/L), no SVOCs listed as COPCs were detected in wells at LF10. There is no MCL or ROD compliance level established for naphthalene.

Dioxin/Pesticides/PCBs

During the October 1998 sampling event, no pesticides or PCBs listed as COPCs were detected in the wells at LF10. Concentrations of one dioxin was found to exceed the ROD compliance level: 2,3,7,8-TCDD in well WP-LF10-MW11A (3.8 x 10^{-6} μg/L).

Inorganics

During the October 1998 sampling event, two inorganics were found to exceed MCLs and ROD compliance levels—arsenic and lead. Arsenic concentrations exceeded the MCL (50 μg/L) and ROD compliance level (11 μg/L) in one extraction well, WP-EW-1001 (54 μg/L). The arsenic ROD compliance level only was exceeded and in one other extraction well (WP-EW-1024 at 27 μg/L) and two monitoring wells (WP-LF10-MW04B at 15 μg/L and WP-LF10-MW09B at 13 μg/L). Lead concentrations exceeded the MCL (15 μh/L) in one extraction well: WP-EW-1019 (32 μg/L).

Figure 2-8 presents the detected concentrations of inorganic COPCs at LF10 (concentrations exceeding MCLs and/or ROD compliance levels are denoted in red).

2.4.7.3 Leachate Collection System Effluent Sample

One sample was collected from the leachate collection system discharge line at OU1. Parameters analyzed for include VOCs, inorganics, oil and grease, total suspended solids, chemical oxygen demand, and pH. None of the VOC or inorganic concentrations detected in the sample exceeded MCLs or ROD compliance levels.

2.5 OU1 Explosive Gas Monitoring

The following section presents an overview of the explosive gas monitoring effort at OU1. As described in Section 2.1, the purpose of the OU1 explosive gas monitoring is to determine the effectiveness of the landfill gas (LFG) collection system in establishing a capture zone that extends outside the landfill boundaries so that migration of explosive gas beyond the landfill boundaries is prevented.

2.5.1 Explosive Gas Monitoring Procedures

Procedures for the explosive gas monitoring at LFs 8 and 10 are presented in the *OU1 Final Operation and Maintenance Plan* (Kelchner, 1997). The existing explosive gas monitoring probes and permanent punchbar locations located within the Base residential property lines surrounding LFs 8 and 10 are used to monitor for landfill gas potentially migrating from OU1 (Figures 2-9 and 2-10). In addition to the monitoring probes and punchbar locations, the gas barrier trench (GBT) located east of LF 10 will be monitored at locations located on the GBT piping (Figure 2-10). The explosive gas monitoring probes, permanent punchbar testing stations, and GBT at LF 8 and 10 will be monitored per the ROD: quarterly for the first five years of the post-remedial action construction period and semiannually between five years and the director's granting authorization to cease monitoring.

Per the *OU1 Final Operation and Maintenance Plan* (Kelchner, 1997), the following general procedures apply to explosive gas monitoring from explosive gas monitoring probe locations, permanent punchbar stations, and the GBT:

- Review the site health and safety plan to identify safety concerns related to methane and landfill gases at LFs 8 and 10.

- Calibrate the combustible gas indicator (CGI), oxygen meter (O_2), and the photoionization detector (PID) according to Field Procedures (FPs) 2-1 and 2-2, respectively.
  Note: In place of the CGI a Landtec GA-90 Infrared Gas Analyzer was used for the explosive gas monitoring. The GA-90 is equipped with a built-in sampling pump that allows for drawing a sample from the explosive gas monitoring probes. Levels of methane, lower explosive limit (LEL), carbon dioxide, oxygen and pressure, are displayed in a digital readout.

- Decontaminate any down-hole equipment to be used according to FP3-1.

- Record monitoring location number, monitoring identification number, date, time, monitoring personnel, and weather conditions in the field logbook.

- Remove monitoring location cap and screen with CGI, O_2 and PID to determine the presence of combustible gas and volatile organic compounds. Record result in the field logbook. Refer to FP 2-1 and FP 2-2 for CGI and PID operating and calibrating guidelines. Monitoring locations will be recapped and the Site Coordinator informed immediately if CGI readings are equal or greater than 25 percent of the LEL or if PID readings are equal to or greater than 1,000 ppm (refer to FP 5-6). If O_2 readings are less than 19.5%, CGI readings may be in error.

- Measure the water level to the nearest 0.01 ft and record (refer to FR 7-2).

If the explosive gas threshold (between 5 percent and 15 percent) is exceeded at a location, the result were verified by immediate re-testing. Upon verification of a reading above the explosive gas threshold limit, WPAFB EMR will be notified. One or more of the following measures may be required if the explosive gas threshold is consistently exceeded:

- Re-balancing of the LFG Collection System.

- Connecting the GBT to the LFG Collection System.

- Upgrading the blower system on the LFG Collection System.

- Upgrading the GBT (e.g., by lengthening or drilling vertical gas vents through the bottom of the GBT).

- Installing a GBT at LF 8.

- Providing explosive gas alarms in occupied structures.
- Evacuating affected structures.

The regulatory agencies would be consulted regarding implementation of any of the measures described above.

2.5.2 Procedure Variances

During the explosive gas monitoring effort, water level measures could not be taken at every probe location. In some instances, the probe cap could not be removed from the probe. Probe LF08-MP007 was not measured because of an inaccessible fenced backyard and entry permission could not be obtained. The remaining probes were dry.

2.5.3 Explosive Gas Monitoring Results

Methane is combustible at concentrations in air between 5 percent [the lower explosive limit (LEL)] and 15 percent [the upper explosive limit (UEL)]. Below 5 percent, there is insufficient methane for combustion; above 15 percent, there is insufficient oxygen for combustion. Results of the explosive gas monitoring for LF8, including well number, date, time and gas concentration, are presented in Table 2-26. Monitoring of the gas wells and punchbar at LF8 was conducted on November 5, 1998 and November 6, 1998. Methane was detected in two wells, LF08-MP008 and LF08-MP010. During a second measurement taken at LF08-MP008, no methane was detected. However, methane was detected a second time at LF08-MP010. Both detections at LF08-MP010 (6.4 and 5.8 percent) were above the LEL of 5%, indicating that there is sufficient methane at this well for combustion.

Monitoring of gas wells and punchbar locations at LF10 was conducted between November 5, 1998 and November 10, 1998. Results of the explosive gas monitoring for LF10 are presented in Table 2-27. Methane was not detected at any of the LF10 wells or punchbars. However, methane was detected in both samples collected from the GBT, at 26.1 percent at GBT-0S and 0.3 percent at GBT-0N. These values are outside combustible concentration range of 5 to 15 percent methane.

2.6 Water Level Monitoring and Evaluation

The objective of measuring groundwater levels is to evaluate the impact of the extraction system on the water levels in the vicinity of the landfills. The *Design Package Number 1, Final (100%) Design* (IT, 1994) states that "the leachate collection system shall establish a capture zone that extends outside the landfill boundaries as determined by groundwater level measurements."

Water levels were measured on October 12, 1998 in monitoring and extraction wells at LF8 and LF10. Measurements were taken to the 0.01-foot in accordance with FP 7-2, using electric tape water level indicators. During the quarterly OU1 water level monitoring, monitoring wells were screened with a PID and a CGI to monitor for the presence of airborne VOCs and combustible gas.

Figures 2-11 and 2-12 show the locations of monitoring and extraction wells that are used to observe groundwater levels at LF8 and LF10, respectively. The coordinates of the wells, their reference point, screen interval, and the water levels are provided in Tables 2-28 and 2-29.

Groundwater contours were generated for the observed hydraulic heads using SURFER, a contouring package (Golden Software, Inc., Golden, Colorado). The contours were generated by first overlying a grid on the landfill. Hydraulic head values at the grid nodes were then computed from the measured values using linear kriging, an interpolation option in SURFER.

In order to show that the extraction system is effective, the water levels in the extraction wells must be measured correctly. This is not a trivial task as the water levels in the extraction wells tend to oscillate as the cycling of the installed pumps occurs.

Landfill 8

The objective of the extraction system at LF8 is to provide a capture area on the downgradient portion of the landfill (east and northeast sides) that prevents migration of the dilute leachate passing through and under LF8. Groundwater in this area flows from west to east, for this reason the extraction wells have been configured at the downgradient boundary of the landfill to provide the necessary capture. Figure 2-13 shows water level contours for LF8 which were generated using both monitoring well and extraction well data. Not all monitoring well water level data were used in the contouring procedure; only monitoring wells with screened intervals at the approximate elevation of the bottom of the extraction wells were contoured. The location of the measuring points used for generating the water level contours are shown in Figure 2-13.

The regional groundwater flow is from west to east, but is altered by the presence of extraction wells that create local cones of depression. The exception is the extraction well EW-0810 which appears to operate properly but does not lower the water level in the well appreciably. Figure 2-14 shows water level contours generated using only monitoring well data. Figures 2-15 and 2-16 show the capture zones of extraction wells on LF8. The arrows in Figure 2-15 represent groundwater velocity vectors. The velocity vectors passing under the landfill area are captured by the extraction wells along the eastern edge of the landfill. The length of an arrow represents a relative groundwater velocity magnitude. Figure 2-16 illustrates the potential contaminant migration paths across LF8 using particle tracking. The only well that is not capturing the groundwater flow is the extraction well EW-0810 in the central portion of the landfill. Methods to improve the effectiveness of EW-0810 and other extraction wells are being evaluated.

Landfill 10

Landfill 10 represents a local hydrologic high where groundwater from outside the landfill does not contribute substantially to leachate generation. The objective of the extraction system at LF10 is to maintain groundwater levels below the elevation of the bottom of the landfill in order to prevent water from mixing with the waste at the landfill. Controlling the groundwater level will then control the leachate at LF10.

The effectiveness of the Landfill 10 extraction system is evaluated by comparing the elevation of the water table to the elevation of the landfill bottom. The system is achieving the stated goal as long as the water table is below the landfill bottom, and thus any verification of the radius of influence for the extraction wells is not necessary. The extraction wells serve the purpose of lowering the water table rather than creating a uniform capture zone under Landfill 10. The effect of including or excluding the water level data from the extraction wells is even more pronounced at LF10 than at LF8. Figures 2-17 and 2-18 show water level elevation contours generated with and without extraction well water levels, respectively. While the regional groundwater flow is north-northeast, it is interesting to note that some local water table mounds exist at extraction well locations (Figure 2-17). For example, well EW-1003 in the southern portion of LF10 has the highest groundwater level in this area.

To examine the effectiveness of each extraction well, historic water level elevations and the landfill bottom elevation at each well were plotted together (Figures 2-19 through 2-28). Landfill bottom elevations were determined from extraction well installation notes and the drilling reference point elevations. The graphs show that the fluctuations in water levels from one sampling event to another can be more than 20 feet. For example, in October 1996 the extraction well EW-1025 had an unusual low water level, compared to its historic data (Figure 2-28). The opposite is true for the well EW-1011 (Figure 2-22) which had 40 feet higher water level in October 1998 than in the last five rounds of sampling. Potential causes for this and other anomalies include measurement inconsistencies. However, the graphs also indicate that the October 1998 water levels are within their historic range. Since the installation of the landfill caps and the installation of the extraction system, the groundwater levels have generally been decreasing.

Figures 2-19 through 2-28 show that the majority of extraction well water levels are below the bottom of the landfill. However, in wells EW-1003 (Figure 2-20) and EW-1016 (Figure 2-24), the water levels are not below the bottom of the landfill. At these wells the hydrographs indicate that the pumps may not be working properly. These issues are currently being evaluated. Figure 2-29 is a cross-sectional profile along the long axis of LF10 which illustrates the variable landfill bottom and water level elevations throughout the landfill.

In conclusion, based on the groundwater levels, it appears that the OU1 extraction system is continuing to provide a capture zone for LF8 and at most LF10 well locations, to maintain water levels below the landfill bottom.

3.0 OU5 Hydraulic Containment Monitoring

Chapter 3 presents the results of the hydraulic containment monitoring for OU5 at Wright-Patterson Air Force Base, Ohio.

3.1 Introduction

The hydraulic containment monitoring at OU5 was conducted in accordance with the OU5 System Performance Monitoring Plan (IT, 1992). The containment monitoring program consists of monthly monitoring of water levels from 25 monitoring wells and one extraction well at OU5. The objective of monitoring groundwater levels is to evaluate effectiveness of the groundwater extraction system in containing contaminated groundwater in the vicinity of the site (i.e, maintaining a capture zone to eliminate migration of leachate beyond the Base boundaries).

3.2 Site Location and Description

OU5, in the southwest corner of Area C (Figure 3-1), is a collection of discrete sites that have, or may have, been used for handling or disposal of hazardous chemical materials in the past, and areas located adjacent to these sites. Discrete sites include Landfill 5 (LF5) and the Landfill 5 Extension, Fire Training Area 1 (FTA1), the Gravel Lake Tanks Site (GLTS), and Burial Site 4 (BS4). Other areas included in OU5 are the area south of LF5 to Hebble Creek, the area west of the WPAFB southwest boundary to Huffman Dam and north to the extension of Trout Creek, and the area north of FTA1 to Hebble Creek.

General refuse from Areas A and C was reportedly disposed of at this landfill from 1945 to 1991. The refuse may have consisted of unknown quantities of oily wastes and solvents and organic and inorganic chemicals. Actual type, quantities, physical state, hazardous constituents, and pollutants disposed of at this site are not known. The landfill area was originally used in the 1940s as a lumber reclamation area where scrap lumber was sold to the public (Engineering-Science, 1990b). After the 1940s, the area was used as a surface waste disposal operation for disposal of general residential refuse. During the 1940s through 1991, LF5 was used as a coal ash disposal area for wastes from the Base heating plants. LF5 was also the site of waste oil collection, separation, burning, and recycling operations for an approximate 15-to-20 year period of time ending in 1978. The northwestern portion of LF5 was also used for explosive ordnance disposal (EOD) and EOD ash disposal for an unspecified period of time (Weston, 1985).

The location of FTA1 was determined from aerial photographs taken between 1953 and 1962, which show a large circular area of approximately 3 acres containing three individual burn pits. FTA1 was in operation from 1950 to 1955 and is currently used as a civil engineering training site for airfield repair exercises (Engineering-Science, 1990b). During its operation, fuels were burned and extinguished in pits surrounded by earthen dikes after first saturating the ground with water to reduce infiltration (Engineering-Science, 1982). The typical fuels used for fire training exercises included, but may not have been limited to, oily wastes, hydrocarbon solvents, and leaded gasoline. Halogenated solvents may have been present as contaminants in the materials burned.

BS4 is located in Area C along a narrow, wooded stretch of Marl Road. The site is approximately 2,000 feet long and 30 to 40 feet wide. It was originally identified from a July 1945 map. Indications of past backfilling activities have been noted at the site. The period of use or types of wastes disposed of at BS4 are not known. Approximately 10 to 15 scattered drums that were visible on the ground surface throughout the site area were removed as part of a drum removal action in 1990. The drums were composited with others from around the Base and specific records as to the contents of the BS4 drums were not maintained (IT, 1995).

The GLTS is located at the southeast corner of Gravel Lake. The site occupies an area of approximately 150 feet by 100 feet and was reported to contain a torque sludge burning vat and four tanks from the 1940s. Details of the facilities and operation of the GLTS are not known. The site is currently wooded with heavy brush (IT, 1995).

3.3 Site Background Information

LF5 and FTA1 were two of the sites initially identified under the IRP and have been the subject of several phases of investigation based on findings of groundwater contamination near LF5 and findings of minor soil contamination at FTA1. BS4 and the GLTS were identified later in the IRP as "new sites" and have had Site Investigations (SIs) completed. Decision Documents were prepared at the end of the SIs, recommending long-term monitoring for BS4 and the GLTS. Burial

Site 4 and the GLTS were included as part of the OU5 RI primarily to accomplish the long-term monitoring recommended at completion of the SIs. A description of the investigations conducted at OU5 are described in the *IRP Remedial Investigation Report Operable Unit 5 WPAFB, Ohio* (WPAFB, 1995). A brief summary of these investigations is presented below:

- *Phase I Records Search.* This document identifies LF5, the LF5 Extension, and FTA1 as potentially contaminated sites and included them in the IRP (Engineering-Science, 1982).

- *Phase II, Stage 1 IRP Confirmation/Quantification.* Activities during this phase of investigation at OU5 included drilling of soil borings and installation of monitoring wells. Activities were conducted during 1982 through 1984 (Weston, 1985).

- *Phase II, Stage 2 Investigations.* These investigations were undertaken to more fully determine the types of contaminants present and potential exposure pathways. Phase II, Stage 2 resulted in ranking of sites in priority order as type I, II, or III. Phase II, Stage 2 work was initiated in 1986 and completed in 1989 (Weston, 1989).

- *Soil Gas and Geophysical Investigations.* A soil gas survey was performed at LF5, FTA1, and several other IRP sites between Autumn 1989 and Summer 1990 to screen for locations of potential contaminant sources (Engineering-Science (1992c, d). During the same period, a geophysical investigation of LF5 was conducted, also to identify potential sources of contamination within LF5. Results of the geophysical investigation are presented by Engineering-Science (1990c, 1991).

- *City of Dayton Wellhead Protection Program.* Monitoring wells were installed in and around the Rohrer's Island Wellfield as part of the City of Dayton Wellhead Protection Program. Some of these locations are important to definition of contaminants within OU5. These wells were installed in 1986 (Geraghty & Miller, 1987). Subsequently, the City of Dayton expanded the wellhead protection monitoring system in the summer of 1990 by installing six additional monitoring locations within the MCD property. In the Summer of 1992, the City of Dayton again expanded the wellhead protection monitoring system by installing six additional monitoring locations within the MCD preserve.

- *Off-site Migration Project.* In the Autumn of 1990, a limited site characterization was initiated to define contaminants at the southwest boundary of Area C (IT, 1992a). Five monitoring locations were installed along the boundary of Area C. This site characterization led to installation of an extraction well located adjacent to LF5 at the southwest boundary of Area C in 1991. Quarterly sampling of over 20 monitoring wells was initiated in 1991.

- *New Sites SI.* A SI of the GLTS and BS4 was conducted during 1991 (SAIC, 1993).

- *Remedial Investigation and Basewide Monitoring Program.* WPAFB completed the investigation of contaminant distribution within OU5 during 1993 with the RI field activities and by the creation of several sampling locations in association with the Basewide Monitoring Program (BMP) (IT, 1995).

Results of these investigations indicated that groundwater, surface water, sediment, and soil at OU5 are contaminated with organics and metals. Beginning in September 1989, a removal action was undertaken at LF5 with the objective to prevent the off-site migration of contaminated groundwater across the southwest boundary of Area C. A control mechanism consisting of a groundwater extraction and water treatment system was designed, constructed, and became operational in December 1991. Because LF5 was the suspected source of contaminants in groundwater, an investigation (Point Source Removal Action) was initiated to determine if a point source of VOCs was present within the landfill and to perform an EE/CA to mitigate such a source. A source of VOCs was not identified, and the focus of the project was shifted to comply with landfill closure regulations to close the IRP site. A Presumptive Remedy of closure by capping was selected under the USEPA's Superfund Accelerated Cleanup Model (IT, 1995). LF5 was capped in the spring of 1996. Subsequent to the implementation of source control measures at LF5, a ROD was prepared and accepted for No Further Action at this site. In addition to the source control measures, a groundwater extraction system was installed to prevent further migration of contaminated groundwater beyond the Base boundary.

As part of the EE/CA (IT, 1999) removal action objectives were identified and removal action alternatives were evaluated for OU5 (FAA-A). Of the four alternatives evaluated, Alternative A4, in-situ treatment via chemical oxidation in the vicinity of EW-1, has the potential to significantly reduce the time necessary to achieve the remedial action objectives. Currently, a Treatability Study including a chemical oxidation pilot-test at EW-1 is being considered.

As indicated in Section 3.1, the results of the groundwater level monitoring at OU5 will be used to evaluate the effectiveness of the leachate extraction system in containing leachate and groundwater in the vicinity of the site. The hydraulic containment monitoring procedures and results conducted under the LTM for OU5 are presented in the sections below. Long-term groundwater monitoring for OU5 is being conducted under the GWOU LTM program and is described in Chapter 6.

3.4 Water Level Monitoring

The objective of measuring groundwater levels at OU5 is to evaluate the impact of the extraction system on the water levels in the vicinity of the site. During the October 15, 1998 water level monitoring, the OU5 groundwater treatment system was not operational. To develop a groundwater contour map representative of pumping conditions at OU5, water level elevations from the December 1998 monthly monitoring were used. The December data includes the dynamic water level elevation of EW-1 which is critical to creating the capture zone. Figure 3-2 shows the locations and water level elevations of the 25 monitoring wells and EW-1 that were monitored on December 9, 1998. Hydraulic head in a monitoring well was computed by subtracting the measured depth to water from the reference elevation for the well (Table 3-1). Out of 25 wells, one well was dry (08-528-M) during the December 9, 1998 sampling.

Groundwater contours were generated for the observed hydraulic head using SURFER, a contouring package (Golden Software, Inc., Golden, Colorado). The area represented in Figure 3-3 is 2,300 feet long and 2,200 feet wide. The contours were generated by first overlying the area by a 231 by 221 grid. The value of the hydraulic head at a grid node was computed from the 22 measured values by using linear kriging, an interpolation option in SURFER.

Accuracy of a water level map depends not only on the number of measured values but also on the distribution of the measuring points (monitoring wells). Figure 3-2 reveals that most of the wells used in monitoring groundwater levels at OU5 are located in a narrow north-south zone on the west side of the Landfill 5. In addition to being concentrated within the narrow zone, the monitoring wells are also clustered. Thus in effect the number of points used in the contouring procedure were reduced. In spite of the poor distribution of the data, the water levels look reasonable considering the historic water levels and the regional groundwater flow direction. The contours in Figure 3-3 indicate that there is a cone of depression caused by pumping of the extraction well EW-1.

3.5 Groundwater Capture Zone Analysis

The main purpose of the extraction well EW-1 is to maintain a capture zone to prevent migration of contaminated groundwater from the Landfill 5 area. The main mechanism of contaminant transport is advection, i.e., a process by which moving groundwater carries dissolved solutes. Thus the understanding the groundwater flow pattern is the first step in an analysis of contaminant transport. In an isotropic aquifer, the flow lines are perpendicular to the equipotential lines (groundwater contours).

During the October 1998 water level monitoring at OU5, the groundwater treatment system and extraction well EW-1 were shutdown for maintenance. The groundwater levels measured on October 15, 1998 are, therefore, not representative of normal pumping conditions and the zone of capture created by EW-1. Figure 3-3 presents the groundwater elevation contours for December, 1998 and indicates that groundwater flow across the eastern portion of Landfill 5 is in the southwest direction. At the western boundary of Landfill 5, groundwater flow direction is altered by EW-1 where a capture zone is created.

The water level map constructed from the measured values was imported into Visual MODFLOW, a widely used groundwater simulation package (Waterloo Hydrogeologic, Inc., Waterloo, Ontario). The model area was discretized into 2310 columns and 220 rows, with a uniform spacing of 10 feet.

The groundwater velocity vectors and particle tracking generated by Visual MODFLOW are illustrated in Figure 3-4 and 3-5, respectively. In addition to the "isotropic" assumption, the aquifer is also assumed to be homogeneous within the model area. The length of a velocity vector is proportional to the actual groundwater velocity. The influence of the extraction well EW-1 on the regional flow can be evaluated by examining the flow pattern in the vicinity to the landfill. The relatively long velocity vectors (Figure 3-4) and particle tracks (Figure 3-5) within the landfill area indicate that the well is "pulling" water beneath the landfill and as a consequence, the water level contours upgradient from the extraction well are closely spaced. Downgradient from the well a stagnation zone is created and the velocity vectors are relatively short. The water level contours in the portion of the aquifer are also widely spaced.

The capture zone of extraction well EW-1 can be outlined by examining the flow directions of the particle tracks. Most groundwater particles under the landfill area are being "captured" by EW-1. However, the particles along the eastern edge of the landfill appear to be outside the EW-1 capture zone. This could simply be a result of the lack of data in this portion of the aquifer. Figure 3-3 shows that the water levels in the southeastern quadrant of the model area are contoured based on a single monitoring well (08-022-M).

In conclusion, based on the groundwater levels and the analysis of the distribution of groundwater velocity, it appears that the extraction well EW-1 is continuing to provide a hydrodynamic barrier to any migration of contaminated groundwater from the Landfill 5 area. The most uncertainty regarding the capture of any potential contaminants originated at the landfill is along the eastern and the southern edge of the landfill. To improve the spatial distribution of groundwater monitoring points in the vicinity of LF5, it is recommended that the following wells (with screened intervals indicated), be included in the monthly monitoring program: CW09-073 (63 - 73 ft), CW12-085 (75 - 85 ft), CW15-055 (45 - 55 ft), CW21-018 (8.5 - 18.5 ft), CW21-040 (30 - 40 ft), MW131M (58.3 - 68.3 ft), MW132S (22.3 - 32.3 ft), and MW133S (43.4 - 53.2 ft). These additional locations will provide a more evenly distributed network of wells to contour the groundwater level elevations.

4.0 Landfill Gas Monitoring at OU4

Chapter 4 presents the results of the landfill gas monitoring at OU4.

4.1 Introduction

Landfill gas monitoring was initiated at OU4 in accordance with the *OU4 Landfill Gas Monitoring Technical Memorandum* (CH2M HILL, 1998) and the *Operation and Maintenance Plan Operable Unit 4 Landfills 3, 4, 6, and 7, and Drum Staging/Disposal Area* (CH2M Hill, 1997). This program includes quarterly monitoring of soil gas at Landfills 3, 4, 6, and 7. The objective of this monitoring program is to evaluate the migration of landfill gas away from the landfills towards nearby structures. Gases may be formed in landfills by microbiological degradation of organic matter and/or by volatilization of organic liquids (e.g., solvents, fuels) creating the potential hazards of explosion and exposure. Data collected as part of this monitoring program is used to evaluate trends in the generation of landfill gas and to determine if a landfill gas collection system at OU4 will be necessary.

4.2 Site Location and Description

Landfills 3, 4, 6, and 7 comprise the fourth of eleven operable units identified at WPAFB. The landfills were active at various times between 1940 and 1962. The landfills are currently covered with grass and topsoil (Landfill 3); grass, topsoil, and clay cover soil (Landfills 6 and 7); and asphalt and pavement (Landfill 4). The landfills are located on the southeastern boundary of Areas A and C (Figure 4-1). Landfill 3 is located east of the intersection of Novick and Hebble Creek Roads. Landfill 4 is located south of Hebble Creek and an unnamed tributary of Hebble Creek parallels the southwest boundary of the landfill on the opposite side of Skeel Avenue. The southern boundary of Landfill 6 is located next to an unnamed tributary that connects with the unnamed tributary flowing between Landfills 4 and 6 that discharges to Hebble Creek. Landfill 7 is located east of two unnamed intermittent tributaries that discharge into Hebble Creek. A drum storage/staging area located northwest of Landfill 7 is also part of OU4. The drums in this area were removed from OU4 in 1990 (CH2M HILL, 1994).

Landfill 3, active from 1940 to 1944, underlies the tenth green of the Military Golf Course and covers about 3 acres. This landfill was used as a surface dump and burn operation; general refuse from Areas A and B were reportedly accepted at the landfill. Landfill 4, which underlies the Civil Engineering equipment storage yard and covers about 8 acres, was active from 1944 to 1949 and accepted general refuse. A water-filled gravel pit in Landfill 4 was reportedly filled with large objects such as automobile bodies. Landfill 6, active from 1949 to 1952, underlies pasture land used by the WPAFB equestrian facility and covers about 7 acres. This landfill was used as a trench and cover operation; a 2 acre water-filled gravel pit covered part of the landfill. Landfill 7, active from 1952 to 1962, also underlies pasture land used by the WPAFB equestrian facility and covers about 18 acres. This landfill was used as a trench and cover operation; general refuse from Areas A and B were accepted at the landfill (CH2M HILL, 1994).

4.3 Site Background Information

Hazardous materials are known to have been landfilled at WPAFB during the active lives of the OU4 landfills and may have been disposed of in the OU4 landfills. However, the types, quantities, physical state, and specific hazardous constituents of wastes disposed of in the four landfills is unknown. To determine whether contamination was present at OU4, several investigations were performed at or near OU4 (CH2M HILL, 1994):

- *Confirmation/Quantification Investigation (Stages 1 and 2):* During these 1985 and 1989 investigations, 17 groundwater monitoring wells were installed within and around the perimeter of OU4. Groundwater, surface water and sediment samples were collected and analyzed. Organic compounds were detected in groundwater samples; metals and one organic contaminant were detected in surface water samples; and organic and metal contaminants were detected in sediment samples. Results are presented in the final *Phase II Stage 1 Report*, Weston, 1985 and the *Stage 2 Technical Report* (Weston, 1989).

- *Skeel Avenue Construction Excavation Sampling:* For the construction of Skeel Avenue connecting Areas A and C with State Route 444, a portion of Landfill 4 was excavated in 1988. Organic and inorganic contaminants were found in soil samples collected during the excavation. Contaminated soil was removed and disposed of at either a sanitary landfill or a hazardous waste landfills. Results of the investigation are presented in the final *Phase II Stage 2 Technical Report* (Weston, 1989).

- *Soil Gas survey for Landfills 3, 4, 6, and 7:* A soil gas survey was conducted at the four landfills between December 1989 and June 1990. Volatile organic compounds and total hydrocarbons were detected in the collected soil samples. Results of the investigation are presented in the *IRP Analysis of Soil Gas Survey Results for Landfills 3, 4, 6, and 7* (Engineering Science, 1992).

- *Geophysical Investigation of Landfills 3, 4, 6, and 7:* Magnetic and electromagnetic conductivity surveys were performed at Landfills 3, 4, 6, and 7 between February and March 1990. Results of the investigation are presented in the *IRP Geophysical Investigation Report for Landfills 3, 4, 5, 6, 7, 8, 10, 11, and 12* (Engineering Science, 1992).

- *Remedial Investigation of OU4:* A remedial investigation of OU4 was conducted between October 1992 and March 1994. Results of the investigation are presented in the *Remedial Investigation Report, Operable Unit 4, Landfills 3, 4, 6, and 7, and Drum Staging/Disposal Area* (CH2M Hill, 1994). Investigations as part of the RI included contaminant source investigations, meteorological investigations, surface water and sediment investigations, geological investigations, soil and vadose zone investigations, groundwater investigations, and an ecological assessment. Volatile organic contaminants were detected in leachate samples; chlorinated VOCs and metals were detected in groundwater samples, and organics and metals were detected in soil, surface water and sediment samples. The conclusions of the RI were that contaminants detected onsite were considered to be related to OU4 activities (e.g., landfill operations, drum disposal).

As documented in the *Basewide Removal Action Plan for Landfill Capping* (IT, 1994), source control measures planned at LFs 3 and 4 consist of implementing routine operation and maintenance for landfill gas monitoring and cover maintenance. Source control measures planned at LFs 6 and 7 consist of improvements to the existing soil cover to eliminate ponding and improve surface runoff, implementation of routine operation and maintenance for landfill gas monitoring, and cover maintenance.

In accordance with the OU4 Landfill Gas Monitoring Technical Memorandum (CH2M HILL, 1998) and the OU4 Operations and Maintenance Plan (CH2M HILL, 1997), landfill gas monitoring at landfill gas wells at Landfills, 3, 4, 6 and 7 is conducted on a quarterly basis. In addition, landfill gas measurements are collected at select locations within Buildings 877 and 878. Monitoring of landfill gas during 1997 detected methane at one of the wells (LG-10) in the vicinity of these buildings. A description of the gas monitoring procedures and monitoring results are presented in the following sections.

4.4 OU4 Landfill Gas Monitoring Procedures

As part of the quarterly monitoring program, eight landfill gas monitoring wells (LG-1, LG-2, LG-3, LG-6, LG-7, LG-8, LG-9, and LG10) were installed around Landfills, 3, 4, 6 and 7 between June 9 and June 20, 1997 (Figure 4-2). Each landfill gas well consists of a 0.5-inch inside diameter PVC well screen and riser. Monitoring of these wells in October 1998 included measurements of methane, carbon dioxide, and oxygen. The procedures used when monitoring the landfill gas wells were as follows:

- Set-up gas monitoring equipment (GA-90 gas analyzer) per the instruction manual (the equipment was pre-calibrated by HAZCO);
- Attach GA-90 tubing to gas monitoring well valve;
- Purge well;
- Record gas readings on monitoring form;
- Close sample valve, disconnect GA-90 tubing; and
- Secure well.

The results of the sampling are presented below.

4.5 OU4 Landfill Gas Monitoring Results

Monitoring of the eight gas wells was conducted on October 14, 1998. Monitoring in Buildings 877 and 878 was conducted on November 10, 1998. Results of the sampling, including well number, date, time and gas concentration, are presented in Table 4-1. Methane was detected in one well, LG-10, at a concentration of 3.1 percent. Methane is combustible at concentrations in air between 5 percent [the lower explosive limit (LEL)] and 15 percent [the upper explosive limit (UEL)]. Below 5 percent, there is insufficient methane for combustion; above 15 percent, there is insufficient oxygen for combustion. Although detected, the methane in LG-10 is not present in sufficient amounts for combustion.

5.0 Activities at OU4

Two new monitoring wells were installed at the northwest corner of Operable Unit 4 (OU4) to provide delineation of the downgradient edge of the VOC plume at OU4. This chapter discusses the installation of those wells and observations made during the installation.

5.1 Site Location and Description

OU4 consists of Landfill 3 (approximately 3 acres), Landfill 4 (approximately 7 acres), Landfill 7 (approximately 18 acres) and the Drum Staging/Disposal Area (DDA). OU4 is located along the southern boundary of Area C and the western-most boundary of Area A, between the intersections of Skeel Avenue and Communications Boulevard and Skeel Avenue and Hebble Creek Road (Figure 4-1).

5.2 Site Background

OU4 was initially investigated in 1981 when Roy F. Weston, Inc. (Weston), performed a Phase I Investigation. Stage 1 and Stage 2 Phase II Site Investigations (SIs) were performed by Weston in 1985 and 1989, respectively. In September 1992, the OU4 RI was conducted by CH2M HILL (HILL, 1994).

Long-term monitoring at OU4 includes the monitoring of eight landfill gas monitoring wells throughout the site and groundwater sampling under the Basewide Long-Term Groundwater Monitoring (LTM) Program.

Investigations of contaminant source areas at OU4 have indicated the presence of chlorinated hydrocarbon groundwater contaminants. It was determined in the Draft-Final Engineering Evaluation/Cost Analysis (EE/CA) for the Basewide Monitoring Program (BMP) at WPAFB (IT, 1998a) that two additional monitoring wells were needed at OU4 to delineate the boundary of the plume in the downgradient direction and to monitor plume migration.

5.3 Objectives

Specific objectives of establishing downgradient monitoring locations were to fill critical data gaps related to risk assessment and contaminant transport analysis. Under the BMP, the two monitoring wells were installed as a well pair in the downgradient direction from OU4 to monitor for the potential migration of the VOC plume (Figure 5-1). The location of the well pair was chosen because it was outside of any known soil or groundwater contamination at OU4. One monitoring well was screened at the bottom of the upper sand and gravel zone (BMP-OU4-MW01B-60), the other well was screened at the top of the lower sand and gravel zone (BMP-OU4-MW01C-84). The purpose of the well cluster is to determine if TCE contamination is infiltrating from the upper sand and gravel zone, through the upper silt/clay (till) zone, into the lower sand and gravel zone.

Sections 5.4 and 5.5 discuss the monitoring well installation field activities and, geology and hydrogeology at OU4, respectively. A discussion on the OU4 landfill gas monitoring and results is presented in Chapter 4.0.

Groundwater sampling of the two new and existing monitoring wells will be conducted semiannually under the Basewide LTM Program. Groundwater analytical results and evaluation for OU4 are presented in the Round 1 Basewide LTM section (Chapter 6.0).

5.4 Monitoring Well Installation Field Activities

Groundwater monitoring well installation procedures are described in the following sections.

5.4.1 Rotasonic Drilling Activities

Rotasonic drilling activities at OU4 were conducted by Bowser-Morner of Dayton, Ohio, concurrently with the Building 59 Site Investigation (SI) drilling activities in Area B of WPAFB. OU4 drilling activities were conducted in accordance with the Building 59 SI Work Plan (IT, 1998b) with the exception of soil sampling. Soil samples from the OU4 monitoring well boreholes were field screened with a photoionization detector (PID) only and were not submitted for off-site laboratory analysis.

A total of two monitoring wells were drilled in the downgradient direction of OU4 (Figure 5-1). Well BMP-OU4-01B-60 was screened in the bottom of the upper sand and gravel unit and had a completion depth of 60 feet below ground surface (bgs). Well BMP-OU4-01C-84 was screened in the top of the lower sand and gravel unit and had a completion depth of 84 feet bgs.

Rotasonic drilling activities began on October 1, 1998 and ended on October 2, 1998. The rotasonic drilling technique used simultaneous high-frequency vibrational and low speed rotational motion to advance the cutting edge of a hollow, circular drill stem. This dual action creates a uniform borehole while providing relatively continuous cores of both unconsolidated and consolidated material. During the drilling process, minimal amounts of drill cuttings, mixed with drilling fluid (potable water), are generated. The potable water drilling fluid was obtained from the Bowser-Morner facility and transported to the Base.

In the rotasonic drilling process, the rotasonic rig pushes a 4-inch internal diameter sample core barrel inside of a 6-inch diameter drive casing. The core barrel is advanced ahead of the drive casing, generally in 5- to 20-foot increments to collect continuous core samples from the undisturbed soils.

After coring of a new interval, the barrel is detached from the drill head and sealed. The drive casing is advanced to just above the leading edge of the core barrel and cuttings are pushed out with potable water and containerized. The core barrel is then retracted from the borehole. At retrieval, the core is extruded from the barrel into a protective plastic sleeve for handling. The extruded core is then screened with an HNu® PID along its entire length (through perforations made in the sleeve). The plastic sleeve is cut open for detailed description.

Soil core lithology is described/recorded on a boring log by the field geologist in accordance with the workplan. PID readings were also recorded on each boring log. Boring logs are presented in Appendix E.

After the lithology and PID readings were recorded, the remaining core was containerized in 55-gallon steel drums. A composite Toxicity Characteristic Leaching Procedure (TCLP) sample was collected from the drummed soils and submitted to Quanterra Analytical Services for analysis. Results of the TCLP analysis indicate that all detected concentrations were below Preliminary Remediation Goals (PRGs) and were nonhazardous. Soils were disposed of by surface spreading at Landfill 12 in Area C.

5.4.2 Monitoring Well Construction

Both well screens were placed to intersect the water table in each aquifer and to allow for seasonal fluctuations in the water table elevation.

All construction materials were decontaminated prior to use following the approved WPAFB field procedure (FP) FP3-2. Both wells were constructed of 2-inch diameter, flush joint threaded, Schedule 40 polyvinylchloride (PVC) riser with a 10 feet length of 0.010 inch slotted PVC well screen. Global #7 filter pack sands were used. Pure Gold™ bentonite pellets were used for the seal and the grout was composed of a mixture of approximately 95 percent cement and 5 percent powdered bentonite.

After advancing the borehole to the desired depth, monitoring wells were installed in accordance with FP5-2. Initially the well riser pipe and screen were assembled and placed in the boring. The sand filter pack was placed around the screen to a height of 3 to 3.5 feet above the top of the screen by pouring the sand into the annular space between the riser pipe and outer Rotasonic casing. Sand depth was periodically checked with a weighted tape measure. Bentonite pellets were then installed on top of the filter pack to create a minimum 2-foot seal prior to placement of the cement-grout mixture. In accordance with the manufacturer's specifications, hydration time of the bentonite seal was not less than 30 minutes following the addition of approximately 5 gallons of potable water. The remaining annulus of the borehole, above the frost line, was completed by filling with a mixture of ASTM type II cement and bentonite grout to the surface for the installation of flush-mounted well vaults.

A 6-inch diameter by 2-foot long, flush-mounted, steel vault casing was placed into the boring and around the top of the casing riser. The remaining annulus was grouted. Well pads consisted of a 1.5-foot diameter circle around the well vault, raised slightly at the center and tapered at the edges.

A well identification tag made of a brass surveyor's pin and stamped with the location name and the well name (i.e., BMP- OU4-01C-60) was embedded in the concrete pad. Monitoring well construction specifications are summarized in Table 5-1. Monitoring well construction logs are presented in Appendix E. Figure 5-2 is an illustration of a typically completed flush-mounted monitoring well.

5.4.3 Monitoring Well Development

Monitoring wells were developed in accordance with the FP5-4 to remove fine particles from the drilling process, ensure free flow of formation water into the well, and to remove any remaining water introduced during drilling.

Wells were developed by surging and pumping using a Geoguard pneumatic bladder pump. The water volume removed during development was based on the water volume in the well calculated in accordance with FP5-4.

Well volume calculations were performed according to the following equation:

$$Vc = p\,(di/2)^2(TD-H)$$

$$Vf = p[(dH/2)^2 - (do/2)^2](TD - S \text{ or } H)(P)$$

$$\text{If } S > H \text{ use } S, \text{ if } S < H \text{ use } H$$

$$Vt = (Vc + Vf)(7.48)$$

Where:

Vc	=	Volume of water in casing, ft^3
Vf	=	Volume of water in filter pack, ft^3
Vt	=	Total volume, gal
di	=	Inside diameter of casing, ft
do	=	Outside diameter of casing, ft
dH	=	diameter of borehole, ft

TD = total depth of well, ft
H = depth to water from ground surface, ft
S = depth to base of seal from ground surface, ft
P = estimated porosity of filter pack (estimated at 30 to 35% for filter pack sand)
7.48 = conversion factor from ft^3 to gallons

The volume of water removed during development was measured by pumping water into a container marked in 0.5-gallon increments.

Temperature, pH, specific conductivity, and turbidity of purged water were monitored during development. Development was determined to be complete when a minimum of three volumes of water had been removed, the physical and chemical parameters had stabilized (pH within +/- 0.1 units, temperature with +/- 0.5 degrees Celsius, and specific conductance with +/- 10 microohms per centimeter), and turbidity was less than 25 NTU. Development details are recorded on well development logs presented in Appendix E.

Wastewater generated from well development was containerized and transferred to the storage tank at OU4 for disposal by a certified treatment and disposal facility.

5.5 Site Geology and Hydrogeology

Geologic and hydrogeologic conditions at OU4 are described in the following sections.

5.5.1 Geology

The elevations across the OU4 area range from about 800 to 830 feet. The bedrock beneath WPAFB consists of gently dipping sedimentary rock of Ordovician and Silurian age (about 400 to 500 million years old) topped by glacial deposits. During glaciation, the bedrock surface was dissected by glaciers and glacial streams that produced deeply eroded stream valleys in the bedrock. OU4 is near the junction of the main bedrock valley overlain by the Mad River to the west and a tributary valley overlain by Beaver Creek.

The glacial sediments consist primarily of Wisconsinian and Illinoisian stage (about 10,000 to 100,000 years old) glacial till and outwash deposits and are more than 250 feet thick in many areas. The general stratigraphy , from top to bottom, of the glacial deposits consists of:

- An upper sand and gravel zone aquifer (outwash),
- An upper semicontinuous silt/clay zone (till),
- A lower sand and gravel zone aquifer (outwash),
- A lower, relatively continuous silt/clay zone, generally located on top of bedrock (till), and
- In some locations, a third sand and gravel zone located on top of bedrock (outwash).

The dense to very dense upper sand and gravel zone consists predominantly of light brown, well-graded medium to coarse sand, gravel, or both. Interbedded within the outwash are thin (generally less than 2 feet) layers of poorly graded fine to medium grained sand, silt, and clay which do not appear to be laterally continuous. The thickness of the upper sand and gravel zone ranges from about 2 to 54 feet, averaging about 35 feet.

The predominant soil type in the upper silt/clay zone is a hard, olive gray, silty, lean clay with varying amounts of sand and gravel. The silt/clay is locally interlayered with discontinuous beds of sand, silt, and gravel. The thickness of the upper silt/clay zone ranges from being absent to 63 feet, averaging about 23 feet.

The lower sand and gravel zone is generally similar to the upper sand and gravel zone, consisting of well graded sands and gravels, but is typically more dense. Thick sequences (up to 30 feet) of fine grained soil are present within the zone and are interpreted to be lacustrine/alluvial deposits. The thickness of the lower sand and gravel zone ranges from about 16 to 70 feet, averaging 42 feet.

The lower silt/clay zone is similar to the upper silt/clay zone consisting primarily of a hard, olive gray, silty, lean clay with varying amounts of sand and gravel. Locally interbedded with the zone are sand and gravel layers. The thickness of the lower silt/clay zone ranges from about 28 to 60 feet thick, averaging 47 feet.

5.5.2 Hydrogeology

The upper sand and gravel zone aquifer is a shallow, water table aquifer. The water table was encountered across OU4 at depths ranging from about 5 to 25 feet bgs and typically did not vary in elevation by more than 1 to 2 feet between sampling rounds. Water table elevations indicate that groundwater flows generally to the north and northwest across OU4 toward the Mad River. Hydraulic conductivity is estimated to be about 3,180 gpd/ft^2 (1.5 x 10^{-1} cm/s) (HILL, 1994).

Where present the upper silt/clay zone acts as an aquitard separating the upper and lower sand and gravel zones. The hydraulic conductivity ranges from 1.1 x 10^{-8} cm/s to 2.5 x 10^{-8} cm/s.

The lower sand and gravel zone exhibits semiconfined conditions throughout most of the OU4 area. The potentiometric surface of the lower sand and gravel zone vary slightly from the water table surface but typically have not varied in elevation by more than 1 to 2 feet between sampling rounds. The direction of groundwater flow through OU4 is generally to the west towards the Mad River (Figure 5- 3). The hydraulic gradient across this portion of OU4 is estimated to be about 1.7 x 10^{-3} ft/ft.

For more detailed information on the geography, geology, hydrology, and hydrogeology of WPAFB, consult the OU4 RI Report (HILL, 1994).

6.0 Basewide Long-Term Monitoring

Section 6 presents the results of the long-term groundwater monitoring for the Groundwater Operable Unit (GWOU) at WPAFB, Ohio.

6.1 Introduction

Long-term monitoring (LTM) was initiated for the GWOU in accordance with the recommendations presented in the *Draft-Final BMP Engineering Evaluation/Cost Analysis (EE/CA), Appendix A: BMP Groundwater Monitoring Plan* (IT, 1998). The monitoring program includes: (1) semiannual sampling of groundwater for volatile organic compounds (VOCs) - basewide wells located in BS5, OU2 , OU3, OU4, OU5, OU8, and OU10; (2) annual sampling of groundwater for VOCs - basewide wells located in BS6, Spill Site 11 (Further Action Area -B), OU8, and OU9; (3) annual sampling of groundwater for inorganics (metals) - basewide wells located in OU2, OU5, OU8, OU9, and OU10; and (4) installation of pumps suitable for micropurge sampling. Semiannual sampling for VOCs analysis is conducted on those wells located in aquifers where the potential exists for contaminant migration beyond the investigation area. Annual sampling is conducted for VOCs analysis on monitoring wells located in Aquifer Layer No. 1 in the higher elevations of Area B (Hill) where the soils are typically glacial till and silty clay. Groundwater flow through this aquifer is very slow and the potential for contaminant migration between sampling rounds is minimal. Metals sampling is conducted annually because of the limited transport characteristics of these inorganics.

The objectives of the continuing LTM for the GWOU are to:

- Collect data to monitor past detections of inorganic contaminants of potential concern (COPCs) above the Maximum Contaminant Levels (MCLs) at WPAFB that do not appear to form congruent contaminant plumes.

- Collect data to monitor areas of groundwater at WPAFB that exceed MCLs for VOCs.

- Collect monitoring data to verify the progress of ongoing remedial efforts in accordance with the RODs at OU1 and OU2.

- Collect monitoring data in accordance with the recommended action for FAA-A (off-site migration of TCE and PCE).

- Collect monitoring data in accordance with the recommended action for FAA-B (vinyl chloride site adjacent to Facility 92 - Drum Storage Area) to evaluate 1998 conditions.

6.2 Site Location and Description

A summary of the source operable units included within the GWOU is provided in the EE/CA, Appendix A. Operable Units 2, 3, 4, 5, 7, 10, and 11 are located within Areas A & C of WPAFB (Figure 1-2). Operable Units 1, 6, 8, and 9 are located within Area B (Figure 1-3). A brief description of each is provided below.

Areas A and C

- OU2 is located in the northeastern portion of Area C and consists of a Burial Site 1 (BS1), Long-term Coal Storage Pile, Temporary Coal Storage Pile, Coal and Chemical Storage Area, Building 89 Coal Storage Area, and Spill Sites (SP) 2, 3, and 10.

- OU3 is located in the western portion of Area C adjacent to the bank of the Mad River and consists of FTAs 2, 3, 4, and 5; LFs 11, 12, and 14; Earthfill Disposal Zones (EFDZs) 11 and 12; and SP1.

- OU4 is located in the southeast portion of Area C and consists of LFs 3, 4, 6, and 7 and a Drum Storage Area.

- OU5 is located at the southwest boundary of Area C and consists of LF5, FTA1, BSA4, and Gravel Lake Tanks Site.

- OU7 is located at the northeast edge of Area C and consists of LF 9.

- OU10 is located on the eastern side of Area C and consists of LF13, Heating Plant (HP) 3, Tank Farm 49A, UST 119, SP4, and East Ramp Tank Removal.

- OU11 is located at the northwest edge of Area C and consists of BS2, Chemical Disposal Area (CDA), and UST Building 4020.

Area B

- OU1 is located at the eastern edge of Area B and consists of LFs 8 and 10.

- OU6 is located at the western edge of Area B and consists of EFDZ1, LF1, and LF2.

- OU8 is located in the northern portion of Area B consists of SPs 5, 6, 7, 9, and 11; and UST71A.

- OU9 is located in the southern portion of Area B and consists of EFDZs 2, 3, 4, 5, 6, 7, 8, 9, and 10; BS3; and HP5.

As discussed in Chapter 1, the GWOU was established under the Basewide Monitoring Plan (BMP) to provide a comprehensive method for monitoring and evaluating the individual source areas (OUs), plume migration and the natural attenuation of contaminants. The BMP consists of:

- Characterization of groundwater, surface water, and sediment sufficiently to conduct a final assessment of risks to human health and the environment.

- Development, evaluation, and selection of appropriate removal actions for groundwater at WPAFB.

The specific objectives of the BMP, as presented in the *Site-Specific BMP Work Plan* (IT, 1995a), are to:

- Compile existing characterization and monitoring data from source area OUs at WPAFB to verify conceptual models, establish basewide background conditions, and summarize groundwater, surface water, and sediment contaminant conditions.

- Summarize groundwater and surface water flow and contaminant transport patterns within and adjacent to WPAFB, establishing background and Base-related conditions.

- Evaluate and modify, as necessary, existing predictive models for analysis of groundwater flow and contaminant transport to provide input data for evaluation of future risk conditions and to assist in remedial design activities.

- Assess current and future risk to human health and the environment from potential multiple source, multiple contaminant plumes for on- and off-site receptors thereby defining areas requiring removal or remedial measures.

- Prepare a coherent removal action strategy.

- Evaluate removal alternatives consistent with an overall remedy for groundwater, surface water, and sediment.

6.3 Previous Investigations

As discussed in Section 1.4, numerous investigations have been undertaken relative to groundwater contamination at WPAFB. Table 2-1 of the EE/CA provides a synopsis of the environmental studies performed on the Base as a whole and those performed on specific OUs. Site investigations began in 1981 with a preliminary assessment/records search. Since that time, investigations and/or remedial actions have progressed at varying rates at the different OUs, depending on complexity, threat to human health and the environment, timing of identification of sites, and budgetary considerations. For example, remedial actions at LF 4 were undertaken in 1987, and capping of LFs 5, 8, and 10 have already been accomplished, while preliminary assessment of the recently identified BS5 and BS6 began only in 1996. An expanded discussion of the results of identified studies is available in other documents, which delineate the extent of contamination at the different OUs. As such, the COPC sources and likely pathways for contaminant migration are well-defined. Chapter 3 of the EE/CA describes the source control measures currently in effect or planned for each OU and the groundwater extraction and treatment systems currently operating.

6.4 Basewide LTM Groundwater Sampling Using Micropurging

For the October 1998 sampling event, groundwater monitoring wells for the basewide LTM program were purged and sampled using micropurge low flow-rate techniques in place of the three-volume method presented in FPs 5-6 and 6-5. Micropurging will be used in all future sampling events because the low flow rates that are required to maintain a constant dynamic water level draw water from directly within the screened interval of the well where the pump inlet is positioned. This eliminates the purging of the entire stagnant water column and, therefore, generates a minimal amount of water to be disposed of.

Monitoring wells were purged and sampled with dedicated bladder (pneumatic) pumps. The dedicated bladder pumps were either existing in the wells from prior sampling programs or were new pumps installed just prior to purging. This section describes pump installation and micropurge sampling of the Basewide LTM program wells.

6.4.1 Pump Installation

Monitoring wells scheduled to be sampled as part of the Basewide LTM program (Section 6.5) were configured to be purged and samples using the micropurge method. Forty-five (45) wells for the basewide LTM program were recommended in the *Draft-Final BMP EE/CA* (IT, 1998) to be configured and sampled in this manner. Of the 45 wells, 10 wells required the installation of dedicated pumps. Bladder pumps were installed in the groundwater monitoring wells in accordance to FP 5.2. The following general procedures were used for installation of the dedicated bladder pumps (see FP 5.2 for more detail):

- Plastic sheeting was placed on the ground around the well casing to contain the pump assembly and associated installation equipment and supplies.
- Wells were sounded for depth to static water level and total well depth.
- Total length of the pump and tubing assembly was determined to position the pump inlet approximately one foot above the bottom of the well and in the screened interval.
- Intake and discharge tubing were measured and cut to the proper length.
- Well cap and fittings were assembled to the end of the tubing, and ensure the well cap assembly will support the pump and tubing.
- Pump and tubing assemblies were carefully lowered into the well.
- Well caps were positioned on the top of the riser casing.

All sampling pumps used to purge the wells are 1.66 inches in diameter and 44 inches in length. Pumps are constructed of stainless steel bodies with Teflon® internal bladders. The bladder pumps in the wells were positioned in the lower portion of the screened interval and pumped at sufficiently low flow rates to maintain water levels with only minimal drawdown.

6.4.2 Micropurging

Well purging is designed to remove stagnant water from the well casing and ensure that groundwater samples collected for analyses are representative of current aquifer conditions. Well purging was conducted in accordance with the following methodology.

- The background and wellhead atmosphere at each location were screened with a photoionization detector (PID) to monitor for the presence of airborne VOCs.

- After VOC screening, static water levels were measured from the top of the inner casing to the nearest 0.01 foot and recorded.

Monitoring wells were purged by the micropurge method in accordance with field procedure FP-5.2. With the micropurge method a minimum purge volume of two pump and two tubing volumes is required. Groundwater quality was considered representative of the surrounding geologic formation when the field parameters and the pumping water level in the well had stabilized as discussed below.

Purge water was monitored in the field for the field parameters of temperature, pH, specific conductivity, dissolved oxygen, and turbidity using a Horiba U-10 water quality meter. Oxidation reduction potential was monitored using a Orion Model 250 portable meter. The meters were placed in a flow-through cell and measurements were collected every five minutes during purging until a set of three stabilized readings were obtained. Readings were considered stabilized when the physical and chemical parameters were within the following limits:

- pH was within ± 0.2 Standard Units

- Water temperature was consistent within ± 1 degree Celsius (°C)

- Specific conductance was consistent within ± 50 microSiemens per centimeter (μS/cm) for readings <500 μS/cm, or ± 10% for specific conductance >500 μS/cm.

A well was also considered to be sufficiently purged if it was purged dry during micropurging. The purge logs for sample collection are presented in Appendix B and the final parameters measured just prior to sampling are summarized in Table 6-1.

Purge water was containerized, transported back to a central staging area and disposed of at a certified treatment and disposal facility.

6.5 LTM Basewide Groundwater Monitoring

Under the Basewide GWOU LTM program, groundwater samples were collected for VOCs analysis from 43 semiannual groundwater monitoring wells and 2 annual groundwater monitoring wells (Figure 6-1.) Groundwater sampling of the monitoring wells was conducted from October 16 through November 5, 1998. As specified in Table A-1 of the *Draft-Final BMP EE/CA* (IT, 1998), samples were collected from the following monitoring wells in October 1998 as part of the semiannual sampling effort and analyzed for VOCs:

BS5: BS5 P-1, BS5 P-2, BS5 P-3, and BS5 P-4.

OU2: NEA-MW34-2S and NEA-MW27-3I (OU10).

OU3: FTA2:MW02C, LF12:MW15A, 07-520-M, 05-DM-123S, 05-DM-123I, 05-DM-123D.

OU4: OU4-MW-02A, OU4-MW-02B, OU4-MW-04A, OU4-MW-03B, OU4-MW-03C, OU4-MW-12B, BMP-OU4-1B-60, and BMP-OU4-1C-84.

OU5: CW05-055, CW05-85, HD-11, HD-12M, HD-12S, HD-13S, HSA-4A (MW131M1), HSA-4B (MW131S), and HSA-5 (MW132M).

OU8: CW3-77.

OU10: OU10-MW-06S, OU10-MW-06D, OU10-MW-11S, OU10-MW-11D, OU10-MW-19D, OU10-MW-21S, OU10-MW-25S, GR-333, GR-334, NEA-MW37-1D, CHP4-MW01, GR-330, and 23-578-M.

As described in Section 6.1, annual sampling of monitoring wells is also a part of the LTM program for the GWOU. Annual samples are collected in April; results from the annual sampling effort will be presented in the next LTM report. As specified in Table A-1 of the EE/CA, samples will be collected from the following monitoring wells in April 1999 and analyzed for VOCs:

BS6: BS6 P-1 and BS6 P-2.

FAA-B: SP11-MW01, SP11-MW02, and SP11-MW03.

OU8: OU8-MW-02S, P6-1, and P6-2.

OU9: EFD04-MW06 and EFD09-M575.

Monitoring wells BS6 P-1 and BS6 P-2 were recently added to the LTM program and will be sampled annually. These two wells were sampled for the first time in November 1998 and are reported here. The sampling schedule for these two wells will be changed to annual and will be sampled again in April 1999.

As specified in Table A-1 of the EE/CA, samples will be collected from the following monitoring wells in April 1999 and analyzed for metals:

OU2: 14-554-M, WP-NEA-MW01-1S, WP-NEA-MW02-2S, WP-NEA-MW20-2S, WP-NEA-MW23-2S, WP-NEA-MW24-2S, and WP-NEA-MW31-2S.

OU5: CW15-055.

OU8: OU8-MW-02D and OU8-MW23D.

OU9: P4-2, WP-EFDZ3-MW02, WP-EFDZ3-MW03, and WP-EFDZ8-MW01.

OU10: 20-566-M, 25-582-M, 25-583-M, 25-584-M, and OU10-MW-06S.

Table A-1 of the EE/CA is presented in Appendix A of this report and contains the monitoring frequency, sampling months, analytical parameters and other sampling rationale for all groundwater and leachate sampling locations monitored under the LTM program.

6.5.1 Groundwater Sampling Methods

Immediately after purging, groundwater samples were collected following field procedure FP 6-5 using the same dedicated pumps. The off-site laboratory (OSL) provided new, certified clean and prepreserved sample containers (VOA vials). Groundwater samples for VOC and total metals analyses were collected by filling each sample container directly from the dedicated Teflon®-lined discharge tubes for each well. Dissolved metals samples were collected in accordance with field procedure FP 6-8 by connecting a 2-micron filter cartridge to the discharge tubing, then purging the cartridge for approximately one minute prior to sampling. Samples were collected directly from the filter cartridge. Samples for total and dissolved metals analysis were preserved after filling and were field checked to ensure the pH was less than 2 by pouring a small amount of sample out of the container onto pH paper. VOC samples were not checked for proper preservation to preserve the zero headspace of the filled VOC vials.

After collection, samples were placed on ice in a cooler and maintained at 4 °C until shipped to the laboratory. Generally, samples were shipped the day of collection; however, in some cases, samples were held overnight in a secured sample cooler for shipment the next day. Samples were shipped by overnight carrier to the Quanterra North Canton, Ohio laboratory.

6.5.2 Field Quality Control Samples

As a check on the quality of field activities (including sample collection, containerization, shipping, and handling), trip blanks, ambient blanks, and field duplicates were collected with specified frequencies following the Project Work Plan (PWP) guidelines. The frequency with which these samples were taken, and number of such samples, are discussed below. In addition, quality assurance (QA)/quality control (QC) requirements for field analyses is also discussed below. Sampling equipment was dedicated for each well, therefore, equipment rinsate samples were not required.

A trip blank is a sample bottle filled by the laboratory with analyte-free laboratory reagent water, transported to the site, handled like a sample but not opened, and returned to the laboratory for analysis. One trip blank consisting of two 40-ml vials was sent to the laboratory with every sample set required to be analyzed for VOCs. Trip blanks were analyzed for VOCs only.

An ambient field blank is water poured into a sample container at the sampling location, handled like a sample, and transported to the laboratory for analysis. The water sampled must be the same water used in any decontamination activities conducted on site. This water is normally organic-free deionized water. One ambient blank was collected during the sampling event for OSL analysis. Ambient blanks were analyzed for all target analytes.

A field duplicate is an additional sample collected independently at a sampling location during a single act of sampling. A duplicate sample is used to assess the representativeness of the sampling procedure. The minimum total number of field duplicates required for each analysis is equal to 10 percent of the samples collected.

The QA/QC program ensures that valid and defensible data are obtained during sampling. QA/QC is performed in accordance with Section 9.0 of the Quality Assurance Project Plan, Volume 2 of the Project Work Plan (ES, 1991). The analytical QA/QC sampling protocol is summarized as follows:

QA/QC Sample Type	Frequency
Trip Blanks	1 per shipping day
Field Duplicates	1 every 10 samples
Ambient Blank	1 per sampling event
Matrix Spikes	1 every 20 samples
Matrix Spike Duplicates	1 every 20 samples

6.5.3 Sample Management

Groundwater samples for OSL VOC and total and dissolved metals analysis were preserved, collected, and handled in accordance with Section 4.0 of Volume 1 and Field Procedure (FP) 6-12 of Volume 2, Appendix C of the Project Work Plan (ES, 1991). Each sample was designated with a unique sample number which identified the location and type of sample collected. The sample number format is as follows:

- Project Identification - The designation "LTM" (Long-Term Monitoring) is used to identify the project.

- Sample Location Identification - Each location is identified by a unique designation. The following designators were used to show the location of each well: "OU" (Operable Unit), "LF" (Landfill), "CHP" (Central Heating Plant), "WP" Wright-Patterson, "NEA" Northeast Area, "EFDZ" Earthfill Disposal Zone, "xx-0yy-M" Phase 2, Stage 1; site No.-well No., "xx-5yy-M" Phase 2, Stage 2; site No.-well No., "CW" OU5 off-site well, "GR" US Geological Survey, and "SP11" (Spill Site 11).

- Sample Media and Sample Number - An alpha-numeric code was used to identify the sample media and the sequence number of the sample. The following designator was used during this task: "GW####" (groundwater and sampling event, i.e. GW01 for the first sampling event under the LTM program).

- Additional designators for QA/QC use - Duplicate samples were identified with "5" preceding the well number designator. Matrix Spike and Matrix Spike Duplicates had "MS" and "MS DUP", respectively, appended to the sample media and sample number designator.

For example, a complete sample identification for a groundwater sample collected from monitoring well No. 1 at Heating Plant 4 during the first round of sampling would be as follows: LTM-CHP4-MW01-GW01. Please note that samples collected for the Baseline LTM under the BMP project in April 1998 had the sample prefix "ROD" for Record of Decision. These samples also had the suffix "GW01" representing the first sampling event under that program.

6.5.4 Sample Handling

Samples were handled in accordance with procedures in Section 5.11.3 of Volume 1 and FP 6-12 of Volume 2, Appendix C of the Project Work Plan. Sample numbers, descriptions and other pertinent information were entered into field logbooks by the Field Team Leaders. In addition, Chain-of-Custody records were completed for each sample. Chain-of-Custody forms contain sample team members, sample numbers, date and time of collection, container types and volumes, preservatives and analytical parameters. Chain-of-Custody forms are presented in Appendix C.

All samples were under direct control of the sampling team members or Site Coordinator until custody was transferred to the overnight freight carrier. While in transit, samples were placed in coolers with custody seals to ensure against tampering.

6.5.5 Sample Containers and Preservation

Sample containers used for OSL VOC analysis were 3 x 40 ml VOA vials with Teflon®-lined septum caps, prepreserved with hydrochloric acid at the providing laboratory (Quanterra). Total and dissolved metals samples were collected in 1 liter polyethylene bottles. Samples were preserved with nitric acid in the field. All containers were labeled with the sample number, collector's initials, date and time of collection, location of sampling point, preservatives added and analytical parameters requested. All samples for chemical analysis were kept at a maximum 4°C by placing the sample containers on ice in insulated coolers until relinquished to FEDEX®.

6.5.6 Project Generated Wastes

Wastewater generated during the investigation consisted of monitoring well purge water. Wastewater generated during the field activities pumped into two 55-gallon drums on the back of each field sampling truck. After filling, the drums then were pumped into two 750-gallon storage tanks staged in the contractors parking lot near OU4. Approximately 1,500 gallons of wastewater were generated during LTM field activities which included the well development at OU4 (Chapter 5.0). The wastewater was transported by vacuum tank-truck to a certified treatment and disposal facility.

6.5.7 Procedure Variances

The only variance to the task SOW was the use of the existing dedicated Grundfos® electric submersible pumps in wells GR-333, GR-334 and FTA2:MW02C in place of installing new bladder pumps. The pumps and fixtures in these wells appeared to be permanently attached and were left in-place.

6.6 Analytical Results

The analytical results from the Basewide LTM sampling for each area are presented in Table 6-2 along with historical groundwater analytical data for each well. Figures 6-2 through 6-9 present the detected concentrations of VOCs (concentrations exceeding MCLs are denoted in red).

As defined in the EE/CA, the remediation goal for organic contaminants of concern (benzene; 1,2-DCA; 1,2-DCE; TCE; vinyl chloride; and PCE) is the MCL for each constituent. The TCE concentration in eleven monitoring wells exceeded the MCL (5 μg/L): OU4-MW-02B, OU4-MW-03B, OU4-MW-03C, OU4-MW-12B, CW05-055, CW05-085, HD-11, OU10-MW-06S, OU10-MW-11D, OU10-MW-19D, and OU10-MW021S. The maximum detected concentration of TCE (83 μg/L) was found in well CW05-085 (OU5). One well, HSA-4A (MW131M), contained a concentration of vinyl chloride (4.2 μg/L) that exceeded the MCL (2 μg/L). The PCE concentration in six monitoring wells exceeded the MCL (5 μg/L): BS5 P-3, BS5 P-4, NEA-MW27-3I, OU10-

MW-11S, OU10-MW-25S, and GR-330. The maximum detected concentration of PCE (33 μg/L) was found in wells BS5 P-3 and BS5 P-4.

6.7 Data Evaluation

The following sections discuss the analytical results from the Basewide LTM sampling for each area. For wells that have a history of VOCs above MCLs, a discussion of the historic trend in concentrations is presented. Table 6-2 presents a summary of the Basewide LTM and historic groundwater analytical data for each well. Figures 6-10 through 6-32 present the historical groundwater analytical data for each well where chemicals of primary concern were detected.

BS5

One VOC, PCE, has previously exceeded the MCL at BS5. Historic VOC concentrations for the sampling locations in BS5 are presented in Table 6-2 and Figures 6-10 and 6-11. As seen in Figure 6-10 and 6-11, PCE has been detected at concentrations above the MCL in wells BS5 P-3 and PS5 P-4 for the October 1998 sampling and the only previous sampling in June 1997. Concentrations of PCE in both wells increased slightly over those from the June 1997 sampling. TCE was detected in three wells (BS5 P-1, BS5 P-3, and BS5 P-4), however, the concentrations were below the MCL. No COPCs have been detected in BS5 P-2.

BS6

Recently added monitoring wells BS6 P-1 and BS6 P-2 were sampled under the Basewide LTM program and are designated as annual monitoring wells. Of the VOCs detected in BS6 P-1 during the November 1998 sampling effort, none were COPCs. No VOCs were detected in BS6 P-2 (Table 6-2).

OU2

Two VOCs have previously exceeded MCLs at OU2. Historic VOC concentrations for the sampling locations in OU2 are presented in Table 6-2 and Figure 6-12. As seen in Figure 6-12, TCE was detected in NEA-MW34-2S during the December 1992 sampling event at 15 μg/L. In subsequent sampling rounds at this well, TCE concentrations have been below detection limits.

PCE has been consistently detected above the MCL in NEA-MW27-3I. PCE was detected at 18 μg/L in the recent sampling event.

OU3

VOCs that have previously exceeded MCLs at OU3 are benzene and TCE. Historic VOC concentrations for the sampling locations in OU3 are presented in Table 6-2 and Figures 6-13 through 6-15. Benzene was detected above the MCL in FTA2:MW02C (6 μg/L) in July 1993. Subsequent sampling indicated that concentrations of benzene were below the MCL or detection limit. TCE was detected above the MCL in LF12:MW15A (12.11 μg/L) in July 1993. Subsequent sampling indicated that concentrations of TCE were below the MCL or detection limit. Concentrations of TCE and 1,2-DCE detected in other wells were below MCLs.

OU4

Vinyl chloride and TCE have previously been equal to or exceeded MCLs at OU4. Historic VOC concentrations for sampling locations in OU4 are presented in Table 6-2 and Figures 6-16 through 6-19. Vinyl chloride was detected at the MCL in OU4-MW-04A in December 1998; subsequent samples were below the detection limit. TCE has been consistently detected above the MCL in OU4-MW-02B, OU4-MW-03B, OU4-MW-03C, and OU4-MW-12B. The concentrations of TCE in these wells appear to be decreasing over time. Concentrations of 1,2-DCE detected in wells have been below the MCL.

OU5

VOCs that have previously exceeded MCLs at OU5 are TCE, vinyl chloride, and PCE. Historic VOC concentrations for the sampling locations in OU5 are presented in Table 6-2 and Figures 6-20 through 6-24. TCE concentrations above the MCL were detected during the October 1998 in wells CW05-055 (6.1 μg/L), CW05-085 (83 μg/L), and HD-11 (51 μg/L). Wells that have had previous TCE concentrations above the MCL but whose concentrations are below the MCL for the October 1998 sampling event include HSA-4A (MW131M), HSA-4B (MW131S), and HSA-5 (MW132S). Vinyl chloride was detected above the MCL in HSA-4A (MW131M) (4.2 μg/L). Previous concentrations of vinyl chloride at this well have been below the detection limit. Concentrations of PCE above the MCL have been previously detected in wells HSA-4B (MW131S) (6.7 and 6.3 μg/L) and HSA-5 (MW132S) (12.1 and 10.5 μg/L). During the October 1998 sampling event, concentrations of PCE in these wells were either below the MCL or the detection limit. Concentrations of 1,2-DCA and 1,2-DCE detected in the wells at OU5 have been below the MCL.

OU8

TCE has previously exceeded the MCL at OU8. Historic VOC concentrations for sampling locations in OU8 are presented in Table 6-2 and Figure 6-25. During three sampling events, TCE concentrations in CW3-77 (8 μg/L, 9 μg/L, and 7.4 μg/L) were above the MCL. The concentration of TCE (3.7 μg/L), however, was below the MCL during the October 1998 sampling event. Concentrations of 1,2-DCE and PCE detected in CW3-77 have been below the MCL.

OU10

VOCs that have previously exceeded MCLs at OU10 are benzene, TCE, and PCE. Historic VOC concentrations for the sampling locations in OU5 are presented in Table 6-2 and Figures 6-26 through 6-32. Benzene was detected above the MCL in NEA-MW37-1D (7 μg/L) in August 1993. Subsequent sampling at this well indicates that benzene concentrations are below the detection limit. TCE concentrations above the MCL were detected during the October 1998 sampling event in wells OU10-MW-06S (14 μg/L), OU10-MW-11D (10 μg/L), OU10-MW-19D (5.7 μg/L), and OU10-MW-21S (9.4 μg/L). Wells that have had previous TCE concentrations above the MCL but had reported concentrations below the MCL or detection limit for the October 1998 sampling event include GR-333, GR-334, CHP4-MW01, and 23-578-M. In recent sampling, concentrations of PCE above the MCL were detected in wells OU10-MW11S (12 μg/L), OU10-MW25S (18 μg/L), and GR-330 (30 μg/L). Wells that have had previous PCE concentrations above the MCL but had reported concentrations below the MCL or detection limit for the October 1998 sampling event include OU10-MW06D.

7.0 Basewide Groundwater Operable Unit Evaluation

This section presents a site-wide evaluation of LTM results for the October 1998 sampling event. The LTM results are compared to the concentration gradients developed during the RI activities (IT, 1997d). These comparisons were used to identify noticeable trends in contaminant concentrations across the site. Additionally, water level information from the October 1998 LTM sampling was compared against past hydrogeologic data to identify any general trend that suggests changes are occurring in groundwater flow conditions at the Base.

7.1 Data Analysis

Both hydraulic head and analytical data were evaluated on a site-wide basis. This analysis included comparison of October 1998 LTM data to RI data to changes in conditions between the sampling periods.

7.1.1 Hydraulic Head Data

Hydraulic head data from each well sampled in the October 1998 sampling event were plotted on basewide potentiometric surface maps developed for the site from the BMP. Water levels used to create the basewide potentiometric surface maps were measured in July 1995. While the LTM program wells represent a small subset of the data locations used to develop the original potentiometric surface maps, they can be compared for overall trends in groundwater flow changes. These data were evaluated to determine if potentiometric surfaces and resultant groundwater flow characteristics identified in the BMP remain valid.

7.1.2 Analytical Data

Analytical results for the following organic compounds from the October 1998 LTM sampling event were plotted on site-wide maps: TCE, PCE, 1,2-DCE, 1,2-DCA, vinyl chloride, and benzene. Concentrations from these compounds were used to develop contour plot maps for each of the three aquifer layers. These maps also present compound-specific concentration contours that had been developed from existing RI data (IT, 1997d). The current and early 1990s findings were compared to evaluate whether there exists:

- Discernable differences in the distribution of VOC detections between the two periods
- Discernable differences in distributions of VOC concentrations between the two periods.

7.2 Hydraulic Conditions

Hydraulic head measurements collected from wells sampled during the October 1998 LTM sampling event are summarized in Table 7-1. Note that these water level data were collected over a period of several weeks and do not provide a "snapshot" of conditions. These data are plotted on potentiometric surface maps for each of the three aquifer layers in Figures 7-1 through 7-3.

Distributions of hydraulic heads from October are generally consistent with the potentiometric surface contours from the BMP. One significant exception is head data from Layer 1 from Burial Site 5 wells located along the western flight line in Area B (Figure 7-1). Head from these wells are slightly depressed from those predicted from the RI data. Wells at Burial Site 5 were installed after the BMP so they were not part of the potentiometric data set used in preparing the potentiometric surface maps for this area in the BMP (1995). The head differences noted here may not be related to actual changed head conditions but rather the differences are likely related to the existence of site specific information for conditions in the Burial Site 5 area. While these heads may not actually be depressed they do suggest that predicted flow directions are consistent with the current measurements.

Heads within the OU5 area for Layer 1 and Layer 2 (Figures 7-1 and 7-2, respectively) are relatively depressed in the 1998 data compared to the BMP contours. However, the elevation and distribution of heads in the two data sets are generally consistent. Groundwater flow directions remain the same. Based on these observations, the interpreted sitewide groundwater flow directions from the BMP remain valid through the current sampling period.

Limited data points in the Layer 3 wells (Figure 7-3) remain consistent with the BMP predictions.

7.3 Analytical Findings

The following discussion presents the observations of the basewide groundwater operable unit evaluation for the October 1998 LTM event. These findings are discussed by contaminant.

7.3.1 TCE

Detections of TCE in each aquifer layer reported from the October 1998 sampling event generally fall within the areas of interpreted TCE plumes from the early 1990s RI data (Figures 7-4 through 7-6). Each layer is discussed below.

Layer 1

Data presented in Chapter 6.0 indicate that TCE concentrations in known plumes at OUs 1, 4, and 5 have generally decreased with time. Exceptions to this occur primarily in some monitoring wells at OU5 (Table 6-2). Concentrations of the TCE detections presented in Figures 7-4 through 7-6 generally fall within the contour levels of plumes developed from the RI sampling. Exceptions include wells where non-detects were reported in areas of previously identified plumes such as south of the OU 10 plume (Layer 1) and down-gradient of OU 5 (Layer 1) both depicted in Figure 7-4.

Two results at higher concentrations than those presented in the BMP are within the large plume immediately southwest of OU 10. TCE was detected at concentrations of 9.4 and 4.9 µg/L at wells OU10-MW-21S and GR-333, respectively. These concentrations are, however, consistent with previous sampling results.

Layer 2

Monitoring well BMP-OU4-01B-60 located within the interpreted Layer 2, 1ppb TCE plume contour on the downgradient side of OU4 (Figure 7-5). TCE was detected at 4.5 µg/L in this newly installed well (first sampled in October 1998). Because this well was installed after the RI, the data from this well may not be indicative of down-gradient migration of TCE. Rather, this data provides additional information about the down-gradient distribution of TCE in the area of OU4.

TCE concentrations in well OU10-MW-06S (Layer 2, OU 10) are slightly higher the those estimated from the RI sampling (14 µg/L versus 1 to 5 µg/L). Overall, however, the data are indicative of ongoing degradation of TCE in the 5 to 10 year period since the RI sampling. This finding is consistent with BMP flow and transport modeling predictions that indicate that 30 to more than 60 years would be required before TCE concentrations will be reduced to below detection limits.

Layer 3

Concentrations in this layer for sampled locations are either at or below predicted concentrations (Figure 7-6).

7.3.2 PCE

The detections of PCE reported from the October 1998 sampling event consistently fall within the areas of interpreted PCE plumes from the early 1990s RI data (Figures 7-7 through 7-9). Based on these data, the distribution of PCE detections from the October 1998 LTM event are not indicative of significant downgradient movement of PCE since the RI sampling.

Data presented in Chapter 6.0 indicate that PCE concentrations in known plumes at OUs 1, 4, and 5 have generally decreased or remained constant with time. Concentrations of the PCE detections presented in Figures 7-6 through 7-9 are consistently within or lower than the contour levels of plumes developed from the RI sampling. These data are indicative of ongoing degradation of PCE in the 5 to 10 year period since the RI sampling. This finding is consistent with BMP flow and transport modeling predictions that indicate that natural degradation properties will result in the decrease in PCE concentrations with time.

7.3.3 1,2-DCA

1,2-DCA was not detected in any samples collected during the October 1998 sampling event. Figures 7-10 through 7-12 have been provided with the locations of the non-detects. This finding is consistent with previous sampling at the wells included in the October 1998 LTM sampling event.

7.3.4 1,2-DCE

The detections of 1,2-DCE reported from the October 1998 sampling event consistently fall within the areas of interpreted 1,2-DCE plumes from the early 1990s RI data (Figures 7-13 through 7-15).

Monitoring well BMP-OU4-01B-60 was installed in October 1998 and is located within the interpreted Layer 2, 1ppb TCE plume contour on the downgradient side of OU4 (Figure 7-14). 1,2-DCE was detected in this well at a concentration of 3.1 µg/L. Adjacent Layer 3 well BMP-OU4-01C-84 had 1,2-DCE detected at a concentration of 1 µg/L (Figure 7-15). Because BMP-OU4-01C-84 well was installed after the OU4 RI, the data from this well may not be indicative of down-gradient migration of 1,2-DCE. Rather, this data provides additional information about the distribution of 1,2-DCE in the area of OU4. Based on these findings, the distribution of 1,2-DCE detections from the October 1998 LTM event are not indicative of significant down-gradient movement of 1,2-DCE since the RI sampling.

Data presented in Chapter 6.0 indicate that 1,2-DCE concentrations in known plumes at OUs 4 and 5 have remained constant or have increased slightly from previous sampling results. Concentrations of the 1,2-DCE detections presented in Figures 7-13 through 7-15 are generally within or lower than the contour levels of plumes developed from the RI sampling.

7.3.5 Vinyl Chloride

Vinyl chloride was detected at greater than 1 µg/L in two wells sampled during the October 1998 LTM sampling, in HD-13S in Layer 1 at OU 5 at a concentration of 1.5 µg/L (Figure 7-16) and HSA-4A (MW131M) in Layer 2 at OU 5 at a concentration of 4.2 µg/L (Figures 7-17). These wells are located immediately down-gradient of OU 5 in areas where vinyl chloride plumes were identified during the BMP and, therefore, do not appear to be related to increasing concentrations or movement of vinyl chloride. Although these data do not appear to be indicative of loading or mobilization of vinyl chloride, concentrations of vinyl chloride in these and other wells should continue to be monitored during future LTM sampling events to evaluate if degradation of higher-end halogenated compounds contributes to additional loading of TCE.

7.3.6 Benzene

Benzene was not detected in any samples collected during the October 1998 sampling event. Figures 7-19 through 7-21 have been provided with the locations of the non-detects. This observation is consistent with previous sampling at the wells included in the October 1998 LTM sampling event.

7.4 Summary

The analytical data from the October 1998 LTM sampling indicate that degradation of TCE, PCE, 1,2-DCE, and vinyl chloride is continuing at WPAFB. Additionally, these data indicate that the locations of organic known plumes are generally stable as significant down-gradient movement of organics has not been observed.

8.0 References

CH2M HILL, 1994, Draft Remedial Investigation Report Landfills 3, 4, 6, and 7, and Drum Staging, Wright-Patterson Air Force Base, Ohio, September.

CH2M HILL, 1997, Operation and Maintenance Plan Landfills 3, 4, 6, and 7, and Drum Staging / Disposal Area, Wright-Patterson Air Force Base, Ohio, April.

CH2M HILL, 1998, OU-4 Landfill Gas Monitoring Technical Memorandum, Wright-Patterson Air Force Base, Ohio, June.

Dames and Moore, Inc., 1986, Draft Site Investigation Report, Landfills 8 and 10, Wright-Patterson Air Force Base, Ohio.

Engineering Science, Inc., (ES), 1982, USAF Installation Restoration Program, Phase I: Records Search, Wright-Patterson Air Force Base, Ohio.

Engineering Science, Inc., (ES), 1990a, Analysis of Soil Gas Survey Results for Landfill 8, the Fire Training Area Adjacent to Landfill 8, Landfill 10 and the Chemical Disposal Trenches at Wright-Patterson Air Force Base, Ohio.

Engineering Science, Inc., (ES), 1990b, Installation Restoration Program (IRP), Project Work Plan for Remedial Investigations and Feasibility Studies at Wright-Patterson Air Force Base, Ohio, as amended through April 1992.

Engineering Science, Inc., (ES), 1990c, DRAFT Installation Restoration Program (IRP) Analysis of Magnetic Survey Results for Landfills 3, 4, 5, 6, 7, 8, 10, 11, and 12 and the Trenches at Landfill 10 at Wright-Patterson Air Force Base, Ohio, June 1990.

Engineering Science, Inc., (ES), 1991, DRAFT Installation Restoration Program (IRP) Geophysical Survey Report for Work Conducted at Landfills 3, 4, 5, 6, 7, 8, 10, 11, and 12 at Wright-Patterson Air Force Base, Ohio, May 1991.

Engineering Science, Inc., (ES), 1992a, Geophysical Survey Report for Work Conducted at Landfills 3, 4, 5, 6, 7, 8, 10, 11, and 12 at Wright-Patterson Air Force Base, Ohio.

Engineering Science, Inc., 1992b, Installation Restoration Program Focused Remedial Investigation Report for Landfills 8 and 10 at Wright-Patterson Air Force Base, Ohio, March.

Engineering Science, Inc., (ES), 1992c, Installation Restoration Program (IRP), Analysis of Soil Gas Survey Results for Landfill 5 at Wright-Patterson Air Force Base, Ohio, January 1992.

Engineering Science, Inc., (ES), 1992d, Installation Restoration Program (IRP), Analysis of Soil Gas Survey Results for Fire Training Area 1 at Wright-Patterson Air Force Base, Ohio, January 1992.

Engineering Science, Inc., 1993, Installation Restoration Program Off-Source Remedial Investigation Report for Landfills 8 and 10 at Wright-Patterson Air Force Base, Ohio, March.

Geraghty & Miller, Inc., 1987, Mad River Well Field Assessment, City of Dayton, Ohio, Geraghty & Miller, Inc., Milwaukee, Wisconsin.

IT Corporation (IT) 1992, OU5 System Performance Monitoring Plan, Wright-Patterson Air Force Base, April.

IT Corporation (IT), 1992a, Volume 5, Field Investigation Report, Battelle Environmental Management Operations, EMO-1028 Vol. 5, AD-902, Issued March 1991, Reissued March 1992, Richland, Washington.

IT Corporation (IT), 1993, Installation Restoration Program Work Plan for Remedial Design of a Source Control Operable Unit Landfills 8 and 10, Wright-Patterson Air Force Base, March.

IT Corporation (IT), 1994, Basewide Removal Action Plan for Landfill Capping, Wright-Patterson Air Force Base.

IT Corporation (IT), 1995, Installation Restoration Program Final Remedial Investigation Report Operable Unit 5, Wright-Patterson Air Force Base, August.

IT Corporation (IT), 1998, Draft-Final Engineering Evaluation/Cost Analysis Groundwater Basewide Monitoring Program, Wright-Patterson Air Force Base. Evaluation of Remedies for Groundwater Operable Unit, Wright-Patterson Air Force Base, Ohio.

Kelchner Environmental, Inc. (Kelchner), 1997, OU1 Final Operations and Maintenance Plan - Part 4.

Weston, 1985, USAF Installation Restoration Program Phase II, Stage 1: Problem Confirmation and Quantification Study.

Weston, 1989, Installation Restoration Program Stage 2 Report for Wright-Patterson Air Force Base, Ohio, July 1989.

Wright-Patterson Air Force Base (WPAFB), 1992, Installation Restoration Program Focused Remedial Investigation Report for Landfills 8 and 10 at WPAFB, Ohio

Wright-Patterson Air Force Base (WPAFB), 1993, Record of Decision: Source Control Operable Unit - Landfills 8 and 10, May.

Table 2-1

OU1 Remedial Action Groundwater Quality Monitoring
Sample Handling Criteria
Wright-Patterson AFB, Ohio

Parameter	Container	Sample Preservative	Holding Time
Volatiles	Three x 40-ml glass vials, no headspace, teflon-lined septum cap	HCl to pH ≤ 2 using 4 drops HCl prior to sampling; Store @ 4°C	Analyze within 14 days
Semi-Volatiles	Two x 1 amber glass container, Teflon-lined cap	Store @ 4°C	Extract within 7 days; analyze within 40 days after extraction
Dioxin/Furans	Two x 1 liter amber glass bottle, Teflon-lined cap	Store @ 4°C	Extract within 1 year; analyze within 90 days after extraction
Metals	One 1 liter polyethylene bottle	HNO^3 to pH ≤ 2 Store @ 4°C Field-filter (FP 6-8)	6 months
Pest/PCBs	One x 1 liter amber	Field-filter (FP 6-8) Store @ 4°C	Extract within 14 days; 40 days to analyze
Ammonia	One x 500 ml poly	H_2SO_4 to pH ≤ 12 Store @ 4°C	Analyze within 28 days
Cyanide	One x 500 ml poly	NaOH to pH > 12 Store @ 4°C	Analyze within 14 days
Extra Extractable	One x 1 liter amber	Store @ 4°C	

Table 2-2
LF08/10 Annual Groundwater Monitoring Field Parameters
Long-Term Monitoring Program: October 1998
Wright-Patterson AFB, Ohio
Page 1 of 3

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (mV)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)	Well Went Dry (Y/N)
02-003-M	10/26/98	4.12	13.6	NA	0.92	8	-79.1	0.37	NR	
LF08-MW02A	10/26/98	5.06	12.9	7.55	1.33	19	-101.6	1 88	NR	
LF08-MW02C	10/26/98	12.54	15.1	7.37	1.34	101	-91	3.98	NR	
LF08-MW04A	10/19/98	34.47	12.2	7	0.734	41	-61.1	1.42	1.02	
LF08-MW04B	10/20/98	31.54	11.3	6.52	0.728	17	-57	0.54	0.91	
LF08-MW04C	10/29/98	22.98	13.7	NA	0.769	160	82.5	10.48	NR	Y
LF08-MW06A	10/28/98	26.08	12.4	NA	1.34	31	-14	0.52	NR	
LF08-MW06B	10/23/98	12.76	11.6	6.96	0.65	881	26.6	8.29	NR	
LF08-MW06C	10/23/98	Dry								
LF08-MW09A	10/22/98	15.3	11.9	7.11	0.634	26	49.2	7.22	0	
LF08-MW09B	10/22/98	14.95	14.5	6.56	0.864	54	149.6	5.05	NR	
LF08-MW10A	10/19/98	25.35	14.5	6.76	0.735	18	-111.5	2.75	NR	
LF08-MW10B	10/19/98	23.19	14.5	6.2	1.81	4	-16.8	1.07	NR	
LF08-MW10C*	10/29/98	22.3	14.8	6.54	1.73	OFF SCALE	24	3.62	NR	Y
LF08-MW101	10/22/98	32.01	13.2	7.25	0.659	OFF SCALE	5	10 13	NR	
LF08-MW102	10/22/98	35.42	13.4	7.2	0.513	276	-136.5	8 65	NR	
LF08-MW103	10/26/98	33.96	13.8	3.96	0.609	OFF SCALE	-67.7	2	NR	

Table 2-2
LF08/10 Annual Groundwater Monitoring Field Parameters
Long-Term Monitoring Program: October 1998
Wright-Patterson AFB, Ohio

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (mV)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)	Well Went Dry (Y/N)
LF10-MW04A	10/28/98	102.15	13.1	NA	0.915	93	-94.2	7.84	NR	
LF10-MW04B	10/27/98	99.22	13.3	9.01	0.592	101	102.5	3.54	NR	
LF10-MW04C	10/29/98	Dry								
LF10-MW05B	10/23/98	20.11	12.7	7.08	0.755	11	-26.6	2.1	NR	
LF10-MW05C*	10/29/98	10.65	14.6	6.96	1.39	100	-66.5	11.42	NR	Y
LF10-MW06A	10/27/98	72.09	13.3	7.48	0.66	18	19.9	9.2	NR	
LF10-MW06B	10/26/98	34.7	15.5	7.13	0.812	15	55.1	3.08	NR	
LF10-MW08A-2	10/20/98	67.89	11.7	6.16	1.07	85	184.2	10.87	NR	
LF10-MW08B	10/29/98	11.76	15.9	6.38	1.92	17	6.6	1.36	NR	
LF10-MW09A	11/1/98	51.62	12	7.4	0 52	180	-132.8	0 2	NR	
LF10-MW09B	10/19/98	49.97	12.8	6.56	1.3	10	-160.2	4.44	NR	
LF10-MW09C	10/29/98	36.07	12.1	6.52	1.07	22	-55.3	2.09	1.31	

Table 2-2
LF08/10 Annual Groundwater Monitoring Field Parameters
Long-Term Monitoring Program: October 1998
Wright-Patterson AFB, Ohio

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (mV)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)	Well Went Dry (Y/N)
LF10-MW11A	10/26/98	30.37	12.3	6.8	0.504	26	-71.9	1.42	NR	
LF10-MW11B	10/26/98	28.32	12.3	6.41	0.778	81	-78.8	1.18	NR	
LF10-MW-102*	10/29/98	61 45	13.8	7.08	0.809	OFF SCALE	96.9	4.19	NR	Y
LF10-MW103*	10/22/98	33.91	15	6.16	1.67	OFF SCALE	-73.8	7.22	NR	Y
LF10-MW104	10/22/98	Dry								
LF10-MW105*	10/22/98	52.2	13.2	7.04	0 451	477	120	ERR	NR	Y

* - Parameters taken one day earlier
BTP - Below top of pump
DO - Dissolved Oxygen
NA - Not available
NR - No reading
ORP - Oxygen Reduction Potential
ERR- equipment error

Table 2-3
OU1 Extraction Well Sampling Field Parameters
LTM Program
Wright-Patterson AFB, Ohio

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp (C°)	pH (SU)	Conductivity (mV)	Turbidity (NTU)	ORP (mv)	DO (mg/L)
Landfill 8								
EW-0803	11/2/98	40.4	10 5	6 43	1 14	166	NR	9 54
EW-0807	11/3/98	DRY						
EW-0812	11/2/98*	42 28	12 3	6 16	2 53	102	-6 1	9 74
EW-0816	11/2/98	54.56	12.1	6 27	2.66	631	-18 3	9 99
Landfill 10								
EW-1001	10/29/98	24.4	Parameters not measured			--	--	--
EW-1003	10/29/98	22.39	Pump not producing water					
EW-1008	10/29/98	DRY						
EW-1012	10/29/98	30 52	15 6	6.48	1 75	400	-22 1	11.67
EW-1015	10/30/98	48 4	Would not sample - dry					
EW-1019	11/2/98	Obstructed	13 2	5.72	1 6	0	69.2	9 77
EW-1020	11/2/98	33 75	Would not sample - dry					
EW-1024	10/30/98	39 66	16	6.25	1	278	-52.1	10.27
EW-1025	10/30/98	29.85	Would not sample - dry					
LF8/10-LW04-1998	10/30/98	NA	15 8	6 45	2.03	55	NA	NA

* - Parameters taken one day earlier
BTP - Below top of pump
DO - Dissolved Oxygen
NA - Not applicable.
NR - No reading due to hydrocarbon sheen on water surface
ORP - Oxygen Reduction Potential

Table 2-4

OU1 Leachate Discharge Line Sampling Program
Wright-Patterson AFB, Ohio

Parameter	Analytical Method[1]	Container	Preservative	Holding Time
Voletile Organics 1,2-Dichloroethene Benzene Methylene Chloride Toluene	EPA 624	Three 40-ml glass vials, no headspace, Teflon-lined septum cap	HCl to pH $\leq$ 2, using r drops Hcl prior to sampling, store @ 4°C.	Within 14 days
Metals (total) Arsenic Cadmium Chromium Copper Lead Mercury Molybdenum Nickel Selenium Zinc	EPA 200	One 1 liter polyethylene bottle	HNO_3 to pH $\leq$ 2, store @ 4°C	6 months
Oil and Grease	EPA 413 1	One 1 liter amber glass	H_2SO_4 to pH $\leq$ 2, store @ 4°C	28 days
Total Suspended Solids	EPA 160 2	One 250-ml polyethylene	store @ 4°C	7 days
Chemical oxygen Demand	EPA 410 1	One 250-ml poly or polyethylene	H_2SO_4 to pH $\leq$ 2, store @ 4°C	28 days
pH	EPA 150.1	One 25-ml glass or polyethylene	None Required	Analyze immediately
Total Flow and Daily Flow	N/A	Field reading from totalizing flow meter and strip chart recorded	N/A	N/A

Table 2-5

OU1 Compliance Levels for Chemicals of Concern
Wright-Patterson AFB, Ohio

Chemicals of Concern	ROD Compliance Level (ug/L)	Maximum Contaminant Level (MCL) (ug/L)
Volatile Organic Compounds (VOCs)		
Benzene	0.62	5
Chloroform	0.28	NA
1,4-Dichlorobenzene	NA	75
trans-1,2-Dichloroethene	0.0677	70
Ethylbenzene	NA	700
Methylene Chloride	6.22	NA
Toluene	NA	1000
Trichloroethene	3.03	5
Vinyl Chloride	0.0283	2
Semivolatile Organic Compounds (SVOCs)		
Benzo(a)pyrene	NA	0.2
Diethylphthalate	NA	NA
4-Methylphenol	NA	NA
Naphthalene	NA	NA
Dioxins/Pesticides/PCBs		
2,3,7,8 TCDD	5.67×10^{-7}	3.00×10^{-5}
1,2,3,4,6,7,8 HPCDF	5.67×10^{-5}	NA
1,2,3,4,6,7,8 HPCDD	5.67×10^{-5}	NA
1,2,3,4,6,7,8,9 OCDD	5.67×10^{-4}	NA
2,3,7,8 TCDF	5.67×10^{-6}	NA
1,2,3,4,6,7,8 HXCDD	5.67×10^{-6}	NA
1,2,3,4,6,7,8,9 OCDF	5.67×10^{-4}	NA
Dieldrin	NA	NA
Aroclor 1242	NA	NA
Aroclor 1248	NA	NA
Aroclor 1254	NA	NA
Aroclor 1260	NA	NA
Inorganics		
Arsenic	11	50
Beryllium	0.02	4
Cadmium	NA	5
Copper	NA	1300
Iron	NA	NA
Lead	NA	15
Zinc	NA	NA
Cyanide	NA	200

NA - Not Applicable

Table 2-6
Groundwater Analytical Results - Summary of VOCs
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,4-DICHLORO-BENZENE	BENZENE	CHLOROFORM	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRANS-1,2-DICHLOROETHENE	TRICHLOROETHENE	VINYL CHLORIDE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	0 62	0 28	NA	6 22	NA	0 0677	3 03	0 0283
Compliance Level - MCL		75	5	NA	700	NA	1000	70	5	2
WP-EW-0803-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	3 2	(8 4)	(2)	ND	(30)	ND	ND	ND	ND
	Apr-97	ND	ND	(3)	ND	ND	ND	ND	ND	ND
	Jul-97	5	(11)	ND	1	(58)	2	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Nov-98	ND	(9 6 J)	ND	ND	(950=)	ND	ND	ND	ND
WP-EW-0807-GW10	Oct-96	ND	(27)	ND	33	ND	150	(2)	ND	ND
	Jan-97	2	(19)	ND	33	(29)	90	(2)	ND	ND
	Apr-97	1	(18)	ND	33	ND	98	(2)	ND	ND
	Jul-97	ND	(1)	ND	3	ND	ND	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-0812-GW10	Feb-89	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-89	ND	0 4	ND	ND	ND	ND	ND	ND	ND
	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(1)	ND	ND	(29)	ND	ND	ND	ND
	Apr-97	ND	(2)	ND	ND	ND	ND	ND	ND	16
	Jul-97	ND	(1)	ND	ND	ND	ND	ND	ND	ND
	Feb-98									
	Jun-98									
	Sep-98	ND	0 54	ND	ND	ND	ND	ND	ND	ND
	Nov-98	ND	ND	ND	ND	(420 =)	ND	ND	ND	ND
WP-EW-0816-GW10	Oct-96	ND	(4)	ND	ND	ND	ND	ND	ND	(21)
	Jan-97	ND	(4)	ND	3	(30)	ND	(2 6)	ND	(41)
	Apr-97	ND	(2)	ND	ND	ND	ND	ND	ND	(12)
	Jul-97	1	(2)	(2)	ND	ND	ND	ND	ND	(8)
	Feb-98	ND	(2 6)	ND	ND	(8 3)	ND	(2 3)	1 9	(24)
	Jun-98	ND	(4 6)	ND	ND	3 5	ND	(2 5)	ND	(49)
	Sep-98	ND	(3 0)	ND	ND	4 4	ND	(2 7)	2 0	(29)
	Nov-98	ND	(2 3 =)	ND	ND	(51 =)	ND	(1 8 J)	(1 7 J)	(18 =)
WP-EW-0816-GW105	Nov-98	ND	(2 9 =)	ND	ND	ND	ND	(2 2 =)	1 9 J	(24 =)

Table 2-7
Groundwater Analytical Results - Summary of SVOCs
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	4-METHYL-PHENOL	BENZO(A) PYRENE	DIETHYL PHTHALATE	NAPHTHALENE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA
Compliance Level - MCL		NA	0 2	NA	NA
WP-EW-0803-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Nov-98	ND	ND	ND	16 JB
WP-EW-0807-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	320	ND	ND	13
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-0812-GW10	Feb-89				
	Jun-89				
	Oct-96	ND	ND	ND	ND
	Jan-97	320	ND	ND	13
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Nov-98	ND	ND	ND	ND
WP-EW-0816-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Nov-98	ND	ND	ND	ND
WP-EW-0816-GW105	Nov-98	ND	ND	ND	ND

Table 2-8
Groundwater Analytical Results - Summary of Dioxin Compounds
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,2 3 4,6,7,8-HPCDD	1,2,3,4 6,7,8-HPCDF	1,2,3,4,7,8-HXCDF	1,2,3,6,7,8-HXCDF	2,3,4 7,8-PECDF	2,3,7,8-TCDD	2,3,7,8-TCDF	DIOXIN	OCDD	OCDF
Units		(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)
Compliance Level - ROD		56 7	56 7	NA	NA	NA	0 567	5 67	0 567	5 67	5 67
Compliance Level - MCL		NA	NA	NA	NA	NA	30	NA	30	NA	NA
WP-EW-0803-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Nov-98	3 0 J	2 0 JQ	ND	ND	ND	ND	ND		(53 JB)	4 J
WP-EW-0807-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
WP-EW-0812-GW10	Feb-89										
	Jun-89										
	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Nov-98	8 0 J	2 5 J	ND	ND	ND	ND	ND		(120 B)	12 J
WP-EW-0816-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Nov-98	ND	ND	ND	ND	ND	ND	ND		1 75 JQB	ND
WP-EW-0816-GW105	Nov-98	ND	ND	ND	ND	ND	ND	ND		3 6 JQB	ND

Table 2-9
Groundwater Analytical Results - Summary of Pesticides/PCBs
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	AROCLOR 1016	AROCLOR 1221	AROCLOR 1232	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	DIELDRIN
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		NA	NA	NA	NA	NA	NA	NA	NA
WP-EW-0803-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-0807-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-0812-GW10	Feb-89								
	Jun-89								
	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-0816-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-0816-GW105	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND

Table 2-10
Groundwater Analytical Results - Summary of Inorganic Compounds
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	ARSENIC	BERYLLIUM	CADMIUM	COPPER	CYANIDE	IRON	LEAD	ZINC
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		11	0 02	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		50	4	5	1,300	200	NA	15	NA
WP-EW-0803-GW10	Oct-96	ND	ND	0 2	ND	ND	59,300	ND	ND
	Jan-97	ND	ND	0 3	ND	ND	21,400	6	63
	Apr-97	(53)	ND	0 8	ND	ND	66,500	ND	ND
	Jul-97	ND	ND	ND	ND	ND	17,300	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Nov-98	ND	ND	ND	ND	16 =	18,200 MBB	ND	53 MBD
WP-EW-0807-GW10	Oct-96	(213)	ND	0 6	ND	ND	802,000	11	3,010
	Jan-97	(89)	ND	0 9	ND	ND	46,000	(26)	420
	Apr-97	(112)	ND	0 3	ND	ND	471,000	ND	ND
	Jul-97	(69)	ND	0 4	ND	ND	208,000	13	1,360
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-0812-GW10	Feb-89								
	Jun-89								
	Oct-96	ND	ND	ND	ND	ND	48,900	ND	ND
	Jan-97	ND	ND	ND	ND	ND	63,800	7	52
	Apr-97	ND	ND	ND	ND	ND	16,100	ND	ND
	Jul-97	ND	ND	ND	ND	ND	38,500	ND	ND
	Feb-98	8	ND	ND	ND	ND	4,300	ND	ND
	Jun-98	0 04	ND	ND	ND	NS	22	ND	ND
	Sep-98	0 03	ND	ND	ND	NS	13	ND	ND
	Nov-98	(410 =)	ND	ND	ND	ND	96,000 =	ND	ND
WP-EW-0816-GW10	Oct-96	ND	ND	ND	ND	ND	16,400	ND	ND
	Jan-97	(1,100)	ND	ND	ND	ND	23,000	ND	ND
	Apr-97	ND	ND	ND	ND	ND	2,610	ND	ND
	Jul-97	ND	ND	ND	ND	ND	7,630	ND	ND
	Feb-98	1	ND	ND	ND	ND	700	ND	ND
	Jun-98	0 24	ND	ND	ND	NS	87	ND	ND
	Sep-98	0 08	ND	ND	0 04	NS	36	0 031	0 05
	Nov-98	(260 =)	ND	ND	ND	ND	49,700 =	ND	ND
WP-EW-0816-GW105	Nov-98	(900 =)	ND	ND	ND	ND	166,000 =	ND	50 =

MBB - This analyte is present at a reportable level in the associated method blank, but is less than 5% of the sample amount
MBD - This analyte is present in the associated method blank at an amout that is less than two times the reporting limit

Table 2-11
Groundwater Analytical Results - Summary of VOCs
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,4-DICHLORO-BENZENE	BENZENE	CHLOROFORM	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRANS-1,2-DICHLOROETHENE	TRICHLOROETHENE	VINYL CHLORIDE
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Compliance Level - ROD		NA	0 62	0 28	NA	6 22	NA	0 0677	3 03	0 0283
Compliance Level - MCL		75	5	NA	700	NA	1000	70	5	2
WP-LF08-MW02A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	1 1 =	ND	ND	ND	ND
WP-LF08-MW02C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	1 2 =	ND	ND	ND	ND
WP-LF08-MW04A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 5 =	ND	ND	ND	ND
WP-LF08-MW04A-GW105	Oct-98	ND	ND	ND	ND	1 7 =	ND	ND	ND	ND
WP-LF08-MW04B-GW10	Oct-96	ND	(8)	ND	ND	ND	20	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 75 =	ND	ND	ND	ND
WP-LF08-MW06B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	(0 75)	ND	0 39	3 4 =	0 96	ND	ND	ND
WP-LF08-MW06C-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF08-MW09A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	(29)	ND	ND	ND	ND
	Oct-98	ND	(1 1 =)	ND	0 33 J	3 1 =	1 3 =	ND	ND	ND
WP-LF08-MW09B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	3 2	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW101-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	2 3 =	0 84 =	ND	ND	ND
WP-LF08-MW102-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	1 1 =	ND	ND	ND	ND
WP-LF08-MW103-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	0 91 =	ND	ND	ND	ND
WP-LF08-MW10A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 31 J	ND	ND	ND	ND
WP-LF08-MW10B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	(9)
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	(6 4)
	Oct-98	ND	ND	ND	ND	0 45 J	ND	ND	ND	(10 =)
WP-LF08-MW10C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	(6)
	Jan-97	ND	ND	ND	ND	(29)	ND	ND	ND	(3 6)
	Oct-98	ND	ND	ND	ND	ND	ND	(0 22 J)	ND	(4 4 =)
WP-LF08-02-003-M-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 83 =	ND	ND	ND	ND

Table 2-12
Groundwater Analytical Results - Summary of SVOCs
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	4-METHYL-PHENOL	BENZO(A) PYRENE	DIETHYL PHTHALATE	NAPHTHALENE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA
Compliance Level - MCL		NA	0 2	NA	NA
WP-LF08-MW02A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW02C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW04A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW04A-GW105	Oct-98	ND	ND	ND	ND
WP-LF08-MW04B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97				
	Oct-98	ND	ND	ND	ND
WP-LF08-MW04C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW06A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW06B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW06C-GW10	Jan-97	DRY	DRY	DRY	DRY
WP-LF08-MW09A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW09B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW101-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND
WP-LF08-MW102-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	0 5
WP-LF08-MW103-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND
WP-LF08-MW10A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW10B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW10C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-02-003-M-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND

Table 2-13
Groundwater Analytical Results - Summary of Dioxin Compounds
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,2,3,4,6,7,8-HPCDD	1,2,3,4,6,7,8-HPCDF	1,2,3,4,7,8-HXCDF	1,2,3,6,7,8-HXCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	DIOXIN	OCDD	OCDF
, Units		(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)
Compliance Level - ROD		56 7	56 7	NA	NA	0 567	5 67	0 567	567	567
Compliance Level - MCL		NA	NA	NA	NA	30	NA	30	NA	NA
WP-LF08-MW02A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		3 4 JQB	ND
WP-LF08-MW02C-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		2 4 JQB	ND
WP-LF08-MW04A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		ND	ND
WP-LF08-MW04A-GW105	Oct-98	ND	ND	ND	ND	ND	ND		ND	ND
WP-LF08-MW04B-GW10	Oct-96							ND		
	Jan-97									
	Oct-98	ND	ND	ND	ND	ND	ND		9 JB	ND
WP-LF08-MW04C-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	1 7 JQS	2 5 JQ	1 4 J	ND	ND	(5 7 JQ)		41 JB	7 8 J
WP-LF08-MW06A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		7 4 JQB	ND
WP-LF08-MW06B-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		24 JB	ND
WP-LF08-MW06C-GW10	Jan-97							DRY		
WP-LF08-MW09A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		2 7 JB	ND
WP-LF08-MW09B-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		3 3 JB	ND
WP-LF08-MW101-GW10	Oct-96							ND		
	Jan-97							ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	52	7 3	ND	ND	ND	ND		(1000 B)	44 J
WP-LF08-MW102-GW10	Oct-96							ND		
	Jan-97							ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	6 9 JQ	1 8 J	0 56 JQ	ND	ND	ND		110 B	6 3 J
WP-LF08-MW103-GW10	Oct-96							ND		
	Jan-97							ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	18 J	2 9	ND	ND	ND	ND		320 B	15 J
WP-LF08-MW10A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		3 2 JB	ND
WP-LF08-MW10B-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		1 9 JBQ	ND
WP-LF08-MW10C-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		34 BJ	ND
WP-LF08-02-003-M-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		4 8 JB	ND

Table 2-14
Groundwater Analytical Results - Summary of Pesticides/PCBs
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	AROCLOR 1016	AROCLOR 1221	AROCLOR 1232	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	DIELDRIN
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		NA	NA	NA	NA	NA	NA	NA	NA
WP-LF08-MW02A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW02C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04A-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06C-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
WP-LF08-MW09A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW09B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW101-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW102-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW103-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW10A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW10B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW10C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-02-003-M-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND

Table 2-15
Groundwater Analytical Results - Summary of Inorganic Compounds
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	ARSENIC	BERYLLIUM	CADMIUM	COPPER	CYANIDE	IRON	LEAD	ZINC
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		11	0 02	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		50	4	5	1,300	200	NA	15	NA
WP-LF08-MW02A-GW10	Oct-96	ND	ND	1	ND	ND	21,700	(22)	63
	Jan-97	ND	ND	ND	60	ND	30	9	70
	Oct-98	ND	ND	ND	ND	ND	4400 =	ND	53 =
WP-LF08-MW02C-GW10	Oct-96	ND	ND	ND	ND	ND	10,700	6	ND
	Jan-97	(50)	ND	ND	50	ND	44,000	(21)	120
	Oct-98	(14 =)	ND	ND	ND	ND	4000 =	ND	ND
WP-LF08-MW04A-GW10	Oct-96	ND	ND	ND	ND	ND	3,670	ND	ND
	Jan-97	(30)	ND	ND	ND	ND	3,300	ND	ND
	Oct-98	(22 =)	ND	ND	ND	ND	1400 =	ND	ND
WP-LF08-MW04A-GW105	Oct-98	(23 =)	ND	ND	ND	ND	1300 =	ND	ND
WP-LF08-MW04B-GW10	Oct-96	ND	ND	ND	ND	ND	8,490	8	ND
	Jan-97	10	ND	ND	(5,400)	ND	8,300	ND	ND
	Oct-98	(18 =)	ND	ND	ND	ND	1200 =	ND	ND
WP-LF08-MW04C-GW10	Oct-96	ND	ND	0 4	ND	ND	19,000	(25)	77
	Jan-97	ND	ND	ND	20	ND	8,300	(400)	30
	Oct-98	ND	ND	ND	ND	ND	1700 =	ND	ND
WP-LF08-MW06A-GW10	Oct-96	ND	ND	ND	ND	ND	2,200	ND	ND
	Jan-97	ND	ND	ND	20	ND	3,500	ND	ND
	Oct-98	ND	ND	ND	ND	ND	220 =	ND	ND
WP-LF08-MW06B-GW10	Oct-96	ND	ND	0 3	ND	ND	978	ND	ND
	Jan-97	10	ND	ND	ND	ND	3,100	ND	ND
	Oct-98	(49 =)	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06C-GW10	Jan-97	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
WP-LF08-MW09A-GW10	Oct-96	ND	ND	ND	ND	ND	418	ND	ND
	Jan-97	ND	ND	ND	20	ND	18,000	6	30
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW09B-GW10	Oct-96	ND	ND	ND	ND	ND	3,520	7	ND
	Jan-97	ND	ND	ND	10	ND	12,000	4	50
	Oct-98	ND	ND	ND	ND	ND	270 =	ND	ND
WP-LF08-MW101-GW10	Oct-96	ND	ND	0 4	ND	ND	6,210	(17)	62
	Jan-97	ND	(7)	ND	ND	ND	54,000	ND	180
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	10 =	ND	ND	26 =	ND	15200 =	26 =	100 =
WP-LF08-MW102-GW10	Oct-96	(61)	(3)	2	164	ND	115,000	(86)	396
	Jan-97	(40)	ND	ND	30	ND	30,000	(17)	90
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	11 =	ND	ND	ND	ND	6200 =	ND	ND
WP-LF08-MW103-GW10	Oct-96	ND	(1)	3	106	ND	56,200	(49)	258
	Jan-97	(50)	ND	ND	50	ND	44,000	(21)	120
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	(13 =)	ND	ND	ND	ND	9000 =	5 1 =	70 =
WP-LF08-MW10A-GW10	Oct-96	ND	ND	0 3	ND	ND	4,610	8	ND
	Jan-97	(30)	ND	ND	ND	ND	6,700	ND	ND
	Oct-98	(25 =)	ND	ND	ND	ND	2300 =	ND	ND
WP-LF08-MW10B-GW10	Oct-96	ND	ND	ND	ND	ND	1,670	ND	ND
	Jan-97	ND	ND	ND	ND	ND	1,400	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1600 =	ND	ND
WP-LF08-MW10C-GW10	Oct-96	(128)	(1)	1 1	82	ND	75,900	(24)	288
	Jan-97	(770)	ND	ND	270	ND	370,000	(80)	590
	Oct-98	(110 =)	ND	ND	67 =	ND	53000 =	(19 =)	230 =
WP-LF08-02-003-M-GW10	Oct-96	ND	ND	0 3	ND	ND	896	5	ND
	Jan-97	(20)	ND	ND	ND	ND	4,000	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1800 =	ND	ND

Table 2-16
Groundwater Analytical Results - Summary of VOCs
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,4-DICHLORO-BENZENE	BENZENE	CHLOROFORM	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRANS-1,2-DICHLOROETHENE	TRICHLOROETHENE	VINYL CHLORIDE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	0 62	0 28	NA	6 22	NA	0 0677	3 03	0 0283
Compliance Level - MCL		75	5	NA	700	NA	1000	70	5	2
WP-EW-1001-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2)	ND	11	(9 5)	ND	ND	ND	ND
	Apr-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-97	ND	(1)	(4)	3	ND	ND	ND	ND	ND
	Feb-98	ND	0 37	ND	ND	ND	ND	ND	ND	ND
	Jun-98	ND	0 4	ND	ND	ND	ND	ND	ND	ND
	Sep-98	ND	0 03	ND	1 2	ND	ND	ND	ND	ND
	Oct-98	ND	(1 6 =)	ND	2 5 =	0 27 J	ND	ND	ND	ND
WP-EW-1003-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2 4)	ND	ND	25	ND	ND	ND	ND
	Apr-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-97	ND	ND	(2)	ND	ND	ND	ND	ND	ND
	Feb-98	ND	(0 84)	ND	ND	ND	ND	ND	ND	ND
	Jun-98	ND	(1)	ND	ND	ND	ND	ND	ND	ND
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96	ND	(5)	ND	4	ND	3	ND	ND	ND
	Jan-97	ND	(3)	ND	ND	ND	ND	ND	ND	(2)
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	ND	(1 1)	ND	ND	ND	0 42	ND	ND	ND
	Jun-98	ND	(0 85)	ND	0 33	0 31	0 56	ND	ND	ND
	Sep-98	ND	(1 4)	ND	0 45	ND	0 27	ND	ND	ND
	Oct-98	ND	(0 67 =)	ND	ND	ND	0 52 =	ND	ND	(0 69 =)
WP-EW-1015-GW10	Oct-96	ND	(10)	ND	29	ND	4	ND	ND	ND
	Jan-97	9	(13)	ND	45	4 6	14	ND	ND	2
	Apr-97	5	(11)	ND	32	ND	2	(3)	ND	ND
	Jul-97	3	(10)	(3)	23	ND	1	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1019-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2)	ND	ND	ND	ND	ND	ND	ND
	Apr-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-97	ND	(1)	ND	1	ND	ND	ND	ND	ND
	Feb-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sep-98	ND	(0 87)	ND	1 84	ND	ND	ND	ND	ND
WP-EW-1019-Duplicate	Sep-98	ND	(0 86)	ND	1 9	ND	ND	ND	ND	ND
	Nov-98	ND	(1 5 =)	ND	ND	(45 =)	ND	ND	ND	ND
WP-EW-1020-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2)	ND	ND	ND	2	ND	ND	ND
	Jul-97	ND	ND	(21)	1	ND	1	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(1)	ND	2	ND	6	ND	ND	ND
	Apr-97	ND	ND	ND	ND	ND	2	ND	ND	ND
	Jul-97	1	(1)	(2)	4	ND	9	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	4 4 =	ND	ND	ND	ND
WP-EW-1025-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY

Table 2-17
Groundwater Analytical Results - Summary of SVOCs
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	4-METHYL-PHENOL	BENZO(A) PYRENE	DIETHYL PHTHALATE	NAPHTHALENE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA
Compliance Level - MCL		NA	0 2	NA	NA
WP-EW-1001-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Oct-98	ND	ND	ND	0 86 =
WP-EW-1003-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	DRY	DRY	DRY	DRY
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97	DRY	DRY	DRY	DRY
	Feb-98				
	Jun-98				
	Sep-98				
	Oct-98	ND	ND	ND	ND
WP-EW-1015-GW10	Oct-96	ND	ND	200	ND
	Jan-97	ND	ND	ND	15
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-1019-GW10 *	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Nov-98	DRY	DRY	DRY	DRY
WP-EW-1020-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	DRY	DRY	DRY	DRY
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	DRY	DRY	DRY	DRY
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Oct-98	ND	ND	ND	ND
WP-EW-1025-GW10	Jan-97	DRY	DRY	DRY	DRY
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY

* - Well went dry during sampling Only VOCs and Dioxins were taken

Table 2-18
Groundwater Analytical Results - Summary of Dioxin Compounds
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,2,3,4,6,7,8-HPCDD	1,2,3,4,6,7,8-HPCDF	1,2,3,4,7,8-HXCDF	1,2,3,6,7,8-HXCDF	2,3,4,7,8-PECDF	2,3,7,8-TCDD	2,3,7,8-TCDF	DIOXIN	OCDD	OCDF
Units		(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)
Compliance Level - ROD		56 7	56 7	NA	NA	NA	0 567	5 67	0 567	5 67	5 67
Compliance Level - MCL		NA	NA	NA	NA	NA	30	NA	30	NA	NA
WP-EW-1001-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Oct-98	ND	ND	ND	ND	ND	ND	ND		ND	ND
WP-EW-1003-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96								ND		
	Jan-97								DRY		
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97								DRY		
	Feb-98										
	Jun-98										
	Sep-98										
	Oct-98	ND	ND	ND	ND	ND	ND	ND		0 58 JQB	ND
WP-EW-1015-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1019-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Nov-98	ND	ND	ND	ND	ND	ND	ND		2 7 JB	ND
WP-EW-1020-GW10	Oct-96								ND		
	Jan-97								DRY		
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96								ND		
	Jan-97								DRY		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Oct-98	ND	ND	ND	ND	ND	ND	ND		0 92 JBQ	ND
WP-EW-1025-GW10	Jan-97								DRY		
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY

Table 2-19
Groundwater Analytical Results - Summary of Pesticides/PCBs
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	AROCLOR 1016	AROCLOR 1221	AROCLOR 1232	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	DIELDRIN
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		NA	NA	NA	NA	NA	NA	NA	NA
WP-EW-1001-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-1003-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				DRY	DRY	DRY	DRY	DRY
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
	Feb-98								
	Jun-98								
	Sep-98								
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-1015-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1019-GW10 *	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Nov-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1020-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				DRY	DRY	DRY	DRY	DRY
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				DRY	DRY	DRY	DRY	DRY
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-1025-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY

* - Well went dry Only VOCs and Dioxins were collected

Table 2-20
Groundwater Analytical Results - Summary of Inorganic Compounds
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	ARSENIC	BERYLLIUM	CADMIUM	COPPER	CYANIDE	IRON	LEAD	ZINC
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		11	0 02	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		50	4	5	1,300	200	NA	15	NA
WP-EW-1001-GW10	Oct-96	(163)	ND	ND	ND	ND	50,200	ND	ND
	Jan-97	(50)	ND	ND	ND	ND	26,000	ND	55
	Apr-97	ND	ND	ND	ND	ND	11,100	ND	ND
	Jul-97	(117)	ND	ND	ND	ND	13,700	ND	ND
	Feb-98	3	ND	ND	ND	ND	1,800	ND	ND
	Jun-98	1 2	ND	ND	ND	NS	190	ND	ND
	Sep-98	0 06	ND	ND	ND	NS	27	ND	ND
	Oct-98	(54 =)	ND	ND	ND	ND	37600 =	ND	ND
WP-EW-1003-GW10	Oct-96	ND	ND	0 4	ND	ND	10,200	ND	ND
	Jan-97	(40)	ND	ND	ND	ND	39,000	ND	55
	Apr-97	ND	ND	ND	ND	ND	23,100	(83)	ND
	Jul-97	(66)	ND	ND	ND	ND	43,000	6	ND
	Feb-98	3	ND	ND	ND	ND	1,700	ND	ND
	Jun-98	0 21	ND	ND	ND	NS	120	ND	ND
	Sep-98	DRY	DRY	DRY	DRY	NS	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96	ND	ND	0 2	ND	ND	73,800	ND	ND
	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	(16)	ND	ND	ND	ND	10,000	ND	ND
	Jun-98	0 27	ND	ND	ND	NS	84	ND	0 03
	Sep-98	0 08	ND	ND	ND	NS	46	ND	0 21
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-1015-GW10	Oct-96	ND	ND	0 7	ND	ND	61,400	9	67
	Jan-97	ND	ND	ND	ND	ND	43,200	ND	ND
	Apr-97								
	Jul-97	ND	ND	ND	ND	ND	40,500	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1019-GW10 *	Oct-96	ND	ND	0 3	ND	ND	5,330	ND	ND
	Jan-97	ND	ND	ND	ND	ND	3,060	ND	ND
	Apr-97	ND	ND	ND	ND	ND	1,040	ND	ND
	Jul-97	ND	ND	ND	ND	ND	12,400	ND	ND
	Feb-98	ND	ND	ND	ND	ND	1	ND	ND
	Jun-98	ND	ND	ND	ND	NS	2	ND	ND
	Sep-98	0 01	ND	ND	0 02	NS	10	ND	0 03
WP-EW-1019 Duplicate	Sep-98	0 01	ND	ND	0 03	NS	11	0 032	ND
	Nov-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1020-GW10	Oct-96	ND	ND	ND	ND	ND	8,070	6	ND
	Jan-97	ND	ND	ND	ND	ND	7,020	ND	ND
	Jul-97	ND	ND	ND	ND	ND	15,900	ND	66
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96	ND	ND	ND	ND	ND	27,200	ND	ND
	Jan-97	ND	ND	ND	ND	ND	15,000	ND	ND
	Apr-97	ND	ND	0 2	ND	ND	5,310	ND	ND
	Jul-97	ND	ND	ND	ND	ND	9,770	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	(27 =)	ND	ND	ND	ND	48700 =	ND	ND
WP-EW-1025-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY

* - Well went dry Samples collected included VOCs and Dioxins

Table 2-21
Groundwater Analytical Results - Summary of VOCs
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,4-DICHLORO-BENZENE	BENZENE	CHLOROFORM	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRANS-1,2-DICHLOROETHENE	TRICHLOROETHENE	VINYL CHLORIDE
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Compliance Level - ROD		NA	0 62	0 28	NA	6 22	NA	0 0677	3 03	0 0283
Compliance Level - MCL		75	5	NA	700	NA	1000	70	5	2
WP-LF10-MW04A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	27	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 56 =	ND	ND	ND	ND
WP-LF10-MW04B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	25	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 69 =	ND	ND	ND	ND
WP-LF10-MW04C-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW05B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	25	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	1 2 =	ND	ND	0 29 J	ND
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND	1 8 =	ND	ND	ND	ND
WP-LF10-MW05C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	4 2	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	2 3 =	ND	ND	ND	ND
WP-LF10-MW06A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2)	ND	ND	11	3 2	ND	ND	ND
	Oct-98	ND	0 55 =	ND	ND	ND	0 74 =	ND	ND	ND
WP-LF10-MW06B-GW10	Oct-96	ND	ND	ND	ND	ND '	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	3 8	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 73 =	ND	ND	1 2 =	(4.2 =)
WP-LF10-MW08A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	3 8	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 47 J	ND	ND	ND	ND
WP-LF10-MW08B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	2 7	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 41 J	ND	ND	ND	ND
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	5 4	ND	ND	ND	ND
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	(1 =)	ND	ND	0 41 J	ND	ND	ND	ND
WP-LF10-MW09C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2 9)	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	(3.2 =)	ND	ND	0 28 J	ND	ND	ND	ND
WP-LF10-MW102-GW10	Jan-97									
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW103-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2 7)	ND	ND	2 5	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	(1 5 =)	ND	ND	1 5 =	ND	ND	ND	ND
WP-LF10-MW104-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW105-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	3 8	55	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	1 2 =	ND	ND	ND	ND
WP-LF10-MW11A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 74 =	ND	ND	ND	ND
WP-LF10-MW11A-GW105	Oct-98	ND	ND	ND	ND	0 91 =	ND	ND	ND	ND
WP-LF10-MW11B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	2 8 =	ND	ND	ND	ND

Table 2-22
Groundwater Analytical Results - Summary of SVOCs
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	4-METHYL-PHENOL	BENZO(A) PYRENE	DIETHYL PHTHALATE	NAPHTHALENE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA
Compliance Level - MCL		NA	0 2	NA	NA
WP-LF10-MW04A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW04B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW04C-GW10	Jan-97	DRY	DRY	DRY	DRY
WP-LF10-MW05B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	0 81
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND
WP-LF10-MW05C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW06A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW06B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW08A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW08B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND
WP-LF10-MW09A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Nov-98	ND	ND	ND	ND
WP-LF10-MW09B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW09C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW102-GW10	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98				ND
WP-LF10-MW103-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND
WP-LF10-MW104-GW10	Jan-97	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
WP-LF10-MW105-GW10	Oct-96	ND	ND	ND	ND
	Jan-97				
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND
WP-LF10-MW11A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW11A-GW105	Oct-98	ND	ND	ND	ND
WP-LF10-MW11B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND

Table 2-23
Groundwater Analytical Results - Summary of Dioxin Compounds
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,2,3,4 6,7,8-HPCDD	1,2,3,4,6,7,8-HPCDF	1,2 3,4,7,8-HXCDF	1,2,3,6,7,8-HXCDF	2,3,4,7,8-PECDF	2,3,7,8-TCDD	2,3,7,8-TCDF	DIOXIN	OCDD	OCDF
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		56 7	56 7	NA	NA	NA	0 567	5 67	0 567	567	567
Compliance Level - MCL		NA	NA	NA	NA	NA	30	NA	30	NA	NA
WP-LF10-MW04A-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		4 JQB	ND
WP-LF10-MW04A-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	4	ND
WP-LF10-MW04B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		15 JB	ND
WP-LF10-MW04B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	15	ND
WP-LF10-MW04C-GW10	Jan-97								DRY		
WP-LF10-MW04C-GW10 Total									DRY		
WP-LF10-MW05B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		1 8 JBQ	ND
WP-LF10-MW05B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	1 8	ND
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND		3 8 JQB	ND
WP-LF10-MW05B-GW105 Total		ND	ND	ND	ND	ND	ND	ND		3 8	ND
WP-LF10-MW05C-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	5 3 J	5 8 J	ND	ND	ND		18 JB	10 J
WP-LF10-MW05C-GW10 Total		ND	ND	5 3	5 8	ND	ND	ND	ND	18	10
WP-LF10-MW06A-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	10 JQS	ND	ND	ND	ND	ND	ND		220 JB	ND
WP-LF10-MW06A-GW10 Total		10	ND	ND	ND	ND	ND	ND	ND	220	ND
WP-LF10-MW06B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		2 5 JB	ND
WP-LF10-MW06B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	2 5	ND
WP-LF10-MW08A-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		6 8 JB	ND
WP-LF10-MW08A-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	6 8	ND
WP-LF10-MW08B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		ND	ND
WP-LF10-MW08B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND		3 3 JB	ND
WP-LF10-MW08B-GW105 Total		ND	ND	ND	ND	ND	ND	ND		3 3	ND
WP-LF10-MW09A-GW10	Oct-96								ND		
	Jan-97								ND		
	Nov-98	ND	ND	ND	ND	ND	ND	ND		2 4	ND
WP-LF10-MW09A-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	2 4	ND
WP-LF10-MW09B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		2 6 JBQ	ND
WP-LF10-MW09B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	2 6	ND
WP-LF10-MW09C-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		ND	ND
WP-LF10-MW09C-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW102-GW10	Jan-97								ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND		18 JB	ND
WP-LF10-MW102-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	18	ND
WP-LF10-MW103-GW10	Oct-96								ND		
	Jan-97								ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS		NS	NS
WP-LF10-MW103-GW10 Total									ND		
WP-LF10-MW104-GW10	Jan-97								DRY		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
WP-LF10-MW104-GW10 Total									DRY		
WP-LF10-MW105-GW10	Oct-96								ND		
	Jan-97										
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND		3 1 JBQ	ND
WP-LF10-MW105-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	3 1	ND
WP-LF10-MW11A-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	1 5 J	ND	ND	ND	ND	ND	ND		12 JB	1 1 JQ
WP-LF10-MW11A-GW10 Total		1 5	ND	ND	ND	ND	ND	ND	ND	12	1 1
WP-LF10-MW11A-GW105	Oct-98	4 7 JQS	ND	ND	ND	ND	(3 8 J)	ND		74 JB	2 4 J
WP-LF10-MW11A-GW105 Total		4 7	ND	ND	ND	ND	3 8	ND		74	2 4
WP-LF10-MW11B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		3 6 JB	ND
WP-LF10-MW11B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	3 6	ND

Table 2-24
Groundwater Analytical Results - Summary of Pesticides/PCBs
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	AROCLOR 1016	AROCLOR 1221	AROCLOR 1232	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	DIELDRIN
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Compliance Level - MCL		NA	NA	NA	NA	NA	NA	NA	NA
WP-LF10-MW04A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW04B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW04C-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
WP-LF10-MW05B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW05C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW06A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW06B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
WP-LF10-MW08A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW08B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW102-GW10	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW103-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW104-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW105-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW11A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW11A-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW11B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND

Table 2-25
Groundwater Analytical Results - Summary of Inorganic Compounds
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	ARSENIC	BERYLLIUM	CADMIUM	COPPER	CYANIDE	IRON	LEAD	ZINC
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		11	0 02	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		50	4	5	1,300	200	NA	15	NA
WP-LF10-MW04A-GW10	Oct-96	ND	ND	0 4	119	ND	4,850	(24)	98
	Jan-97	ND	ND	ND	ND	ND	700	ND	ND
	Oct-98	ND	ND	ND	ND	ND	2500 =	ND	ND
WP-LF10-MW04B-GW10	Oct-96	ND	ND	0 3	ND	ND	5,730	13	ND
	Jan-97	ND	ND	ND	ND	ND	4,300	4	ND
	Oct-98	(15 =)	ND	ND	ND	ND	16000 =	ND	ND
WP-LF10-MW04C-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW05B-GW10	Oct-96								
	Jan-97	ND	ND	ND	ND	ND	500	ND	ND
	Oct-98	ND	ND	ND	ND	ND	390 =	ND	ND
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND	ND	430	ND	ND
WP-LF10-MW05C-GW10	Oct-96								
	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW06A-GW10	Oct-96	ND	ND	0 8	ND	ND	7,060	15	ND
	Jan-97	ND	ND	ND	ND	ND	1,700	ND	ND
	Oct-98	ND	ND	ND	ND	ND	190 =	ND	ND
WP-LF10-MW06B-GW10	Oct-96	ND	ND	ND	ND	ND	1,020	ND	86
	Jan-97	ND	ND	ND	ND	ND	900	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1400 =	ND	ND
WP-LF10-MW08A-GW10	Oct-96								
	Jan-97	ND	ND	ND	ND	ND	10,000	5	ND
	Oct-98	ND	ND	ND	ND	ND	1200 =	ND	ND
WP-LF10-MW08B-GW10	Oct-96	(232)	(2)	3 3	67	ND	99,000	(50)	331
	Jan-97	(50)	ND	ND	30	ND	41,000	(24)	110
	Oct-98	ND	ND	ND	ND	ND	360 =	ND	52 =
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND	ND	360 =	ND	ND
WP-LF10-MW09A-GW10	Oct-96	ND	ND	ND	ND	ND	2,550	6	ND
	Jan-97	ND	ND	ND	ND	ND	2,500	ND	ND
	Nov-98	ND	ND	ND	ND	ND	2,700	ND	ND
WP-LF10-MW09B-GW10	Oct-96	ND	ND	ND	ND	ND	2,550	6	ND
	Jan-97	10	ND	ND	ND	ND	7,500	ND	ND
	Oct-98	(13)	ND	ND	ND	ND	7500 =	ND	ND
WP-LF10-MW09C-GW10	Oct-96	ND	(1)	0 9	68	ND	67,300	(48)	263
	Jan-97	10	ND	ND	ND	ND	30,000	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1500 =	ND	ND
WP-LF10-MW102-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW103-GW10	Oct-96	(273)	(10)	ND	631	ND	407,000	(233)	1460
	Jan-97	(70)	ND	ND	20	ND	27,000	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW104-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW105-GW10	Oct-96	ND	ND	ND	ND	ND	1,310	ND	ND
	Jan-97	ND	ND	ND	20	ND	4,100	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW11A-GW10	Oct-96	ND	ND	ND	ND	ND	1,760	ND	ND
	Jan-97	ND	ND	ND	ND	ND	2,600	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1100 =	ND	ND
WP-LF10-MW11A-GW105	Oct-98	ND	ND	ND	ND	ND	1,100	ND	ND
WP-LF10-MW11B-GW10	Oct-96	ND	ND	ND	ND	ND	12,100	12	58
	Jan-97	10	ND	ND	20	ND	22,000	13	60
	Oct-98	ND	ND	ND	ND	ND	2900 =	ND	300 =

Table 2-26
Field Measurements
Explosive Gas Montoring - Landfill 8
Quarterly Status Report: Oct - Dec 1998
Wright-Patterson Air Force Base

Location	Probe Press. (2) (in. of Hg)	GW Depth (ft, TOC)	Probe Oxygen (%)	(% Methane/% LEL) Initial (3)	Sustained (4)	Methane TLV (5)	Monitoring Utility Line(s)	Distance/Direction From Nearest Probe/Structure	Comments
Landfill 8									
LF08-MP001	29.0	Dry	10.5	0/0	--	0.11	Unknown	91 ft. West	
LF08-MP002	28.8	Would Not Open [6]	14.0	0/0	--	0.19	Unknown	150 ft West	
LF08-MP003	29 0	8 57	18.9	0/0	--	0.25	Unknown	200 ft. West	
LF08-MP004	28.9	Would Not Open [6]	16.0	0/0	--	0.23	Unknown	160 ft. West	
LF08-MP006	28.9	Would Not Open [6]	19.7	0/0	--	0.05	Unknown	39 ft. South	
LF08-MP007	Could not enter yard					0.06	Unknown	50 ft. North	Not Accessible
LF08-MP008	29.0	Would Not Open [6]	6.7	0.5/10	0/0	0.02	Unknown	17 ft. North	
LF08-MP009	29.0	Would Not Open [6]	5.7	0/0	--	0.03	Unknown	20 ft. North	
LF08-MP010	29.1	Dry	2.0	6.4/128	5.8/116	0.03	Unknown	22 ft. North	
LF08-MP011	29.1	Would Not Open [6]	1.7	0/0	--	0.02	Unknown	17 ft. North	
LF08-MP012	29.1	Would Not Open [6]	2.9	0/0	--	0.02	Unknown	13 ft. North	
LF08-MP013	29.1	Would Not Open [6]	19.4	0/0	--	0.03	Unknown	20 ft. South	No press. fitting
LF08-PT003	29.0	NA	19.9	0/0	--	0.02	Unknown	12 ft. North	

Notes.
1. Abbreviations in. = inches, ft,bgs = feet below ground surface, TLV = threshold limit value (see Note 6), N/A = not available, GBT = gas barrier trench, N = north, S = south.
2 Pressure readings taken via pressure valve in unvented cap at top of probe.
3. Initial gas concentrations reading taken after purging probe a minimum of 30 seconds
4 Sustained combustible gas concentration reading taken approximately one hour after removing unvented lid from monitoring probe
5 Methane TLV was calculated using the formula T = (0 00125)(H), where T = threshold limit value, H = horizontal distance in feet between probe and closest occupied structure
6 NT = GW Depth not taken because the inner probe cap would not open due to rust or damage

Table 2-27
Field Measurements
Explosive Gas Montoring - Landfill 10
Quarterly Status Report: Oct - Dec 1998
Wright-Patterson AFB, Ohio

Location	Probe Press (2) (in. of Hg)	GW Depth (ft, TOC)	Probe Oxygen (%)	(% Methane/% LEL) Initial (3)	Sustained (4)	Methane TLV (5)	Monitoring Utility Line(s)	Distance/Direction From Nearest Probe/Structure	Comments
Landfill 10									
LF10-MP014	29 0	Dry	11.0	0/0	--	0.04	Unknown	30 ft. Northwest	
LF10-MP016	See Note 7					0.11	Unknown	87 ft. Southeast	No press. fitting
LF10-MP018	Probe Not Found	--	--	--	--	0.08	Unknown	61 ft. North	Not found
LF10-MP019	29 1	Dry	19.4	0/0	--	0.03	Unknown	25 ft. West	
LF10-MP020	29.1	Dry	7.2	0/0	--	0.02	Unknown	18 ft. East	
LF10-MP021	29.1	Dry	18 3	0/0	--	0.02	Unknown	17 ft. East	
LF10-MP023	29.1	Would Not Open [6]	20.1	0/0	--	0.02	Unknown	15 ft. Southeast	
LF10-MP026	29.1	3.97	18.7	0/0	--	0.02	Unknown	18 ft. East	
PT030	28.2	NA	19.4	0/0	--	0.09	Cable TV	70 ft. East	
PT031	28.2	NA	18.7	0/0	--	0.09	Cable TV	70 ft. East	
PT035	29.1	NA	19.7	0/0	--	0.08	Cable TV	66 ft. East	
PT036	29.1	NA	19.8	0/0	--	0.09	Cable TV	69 ft. East	
PT060	28.2	NA	20.6	0/0	--	0.08	Unknown	65 ft. East	
PT065	28.2	NA	20.5	0/0	--	0.09	Unknown	69 ft. East	
PT078	28.2	NA	19.3	0/0	--	0.05	Sewer	39 ft Northeast	
PT085	28.2	NA	13.7	0/0	--	0.08	Sewer/Electric	60 ft. Soutwest	
PT088	28.3	NA	19.3	0/0	--	0.02	Gas	14 ft. Northeast	
PT090	28.2	NA	17.9	0/0	--	0.24	Gas	196 ft Southeast	
PT091	28.3	NA	19.3	0/0	--	0.28	Sewer	225 ft. Southeast	
PT093	28.4	NA	20.5	0/0	--	0.38	Sewer	225 ft. Southeast	
PT095	28.4	NA	20.4	0/0	--	0 38	Sewer	300 ft. North	
PT100	28.4	NA	18.7	0/0	--	0.44	Sewer	350 ft. Southeast	
LF10-GBT0S	28.3	Dry	1.3	26.1/522	--	0.09	GBT-S	75 ft. Southeast	
LF10-GBT0N	28.2	Dry	0.0	0.3/6	--	--	GBT-N	39 ft. East	

Notes.

1 Abbreviations in = inches, ft,bgs = feet below ground surface, TLV = threshold limit value (see Note 5), N/A = not available, GBT = gas barrier trench, N = north, S = south

2 Pressure readings taken via pressure valve in unvented cap at top of probe

3 Initial gas concentrations reading taken after purging probe a minimum of 30 seconds

4 Sustained combustible gas concentration reading taken approximately one hour after removing unvented lid from monitoring probe.

5 Methane TLV was calculated using the formula T = (0 00125)(H), where T = threshold limit value, H = horizontal distance in feet between probe and closest occupied structure.

6 Inner probe caps were damaged or rusted shut and could not be opened to obtain a water sample

7 Pressure fitting missing, open tube filled with water

Table 2-28
LF8 Groundwater Levels (10/12/98)
Wright-Patterson AFB, Ohio

Well No.	Easting (ft.)	Northing (ft.)	Ref. Point Elevation (ft)	Well Depth (ft)	Screen Interval (ft)	GW Depth (ft) 10/12/98	GW Elevation (ft) 10/12/98
EW-0803	1557209	654410	936.73	55.5	5.0-55.5	50.81	885.92
EW-0805	1557238	654525	938.54	55.5	5.5-55.5	50.23	888.31
EW-0810	1557326	654916	930.69	55.0	5.0-55.5	24.57	906.12
EW-0812	1557334	655116	926.88	50.0	5.0-50.0	42.28	884.60
EW-0816	1557253	655198	932.99	55.0	5.0-55.0	54.56	878.43
02-003-M	1557617	655096	850.24	44.0	24.0-44.0	4.64	845.60
02-DM-82-M	1557459	654766	893.37	64.5	29.0 - 39.0	12.20	881.17
02-DM-83D-M	1557333	655331	912.56	72.7	37.1-47.1	14.80	897.76
02-DM-83S-M	1557327	655335	913.32	17.0	12-17	18.12	895.20
02-DM-84-M	1557463	654745	914.49	57.8	28.0 - 33.0	20.58	893.91
02-DM-85-M	1557384	654423	894.81	52.5	27.0 - 32.4	4.95	889.86
LF08-MW01A	1557152	654131	905.69	42.2	23.8 - 29.4	5.19	900.50
LF08-MW01C	1557142	654122	905.92	17.0	7.2 - 15.0	7.31	898.61
LF08-MW02A	1557372	654417	894.07	56.0	43.7-53.7	5.12	888.95
LF08-MW02C	1557391	654446	895.61	24.0	11.7-21.7	12.76	882.85
LF08MW04A	1557618	654837	913.45	68.0	51.3-63.0	31.41	882.04
LF08-MW04B	1557623	654828	912.76	39.0	29.5-37.0	25.15	887.61
LF08-MW04C	1557612	654828	914.02	28.0	21.0-26.0	23.05	890.97
LF08-MW05A	1556723	654623	949.38	88.0	59.8-69.8	31.61	917.77
LF08-MW05B	1556732	654680	949.17	53.8	41.7 - 51.7	21.50	927.67
LF08-MW05C	1556733	654621	949.30	30.0	17.75 - 27.75	19.62	929.68
LF08-MW06A	1557657	655112	891.30	80.0	53.5-73.8	28.97	862.33
LF08-MW06B	1557652	655106	890.63	45.0	32.75-42.75	12.66	877.97
LF08-MW07A	1556513	654823	952.62	64.0	43.7-53.7	23.51	929.11
LF08-MW07B	1556521	654828	952.56	40.0	33.0-38.0	24.05	928.51
LF08-MW07C	1556521	654819	952.79	31.0	24.0-29.0	24.07	928.72
LF08-MW08A	1557714	655230	878.70	36.0	16.7-32.0	5.14	873.56
LF08-MW08B	1557719	655238	878.63	24.0	16.67-22.0	5.09	873.54
LF08-MW08C	1557721	655230	877.72	14.0	6.67-11.67	9.62	868.10
LF08-MW09A	1557936	655487	855.38	32.5	25.2-30.2	15.20	840.18
LF08-MW09B	1557937	655481	856.01	20.5	13.67-18.67	14.92	841.09
LF08-MW10A	1557510	655374	911.86	66.0	53.7-63.8	25.39	886.47

Table 2-28
LF8 Groundwater Levels (10/12/98)
Wright-Patterson AFB, Ohio

Well No.	Easting (ft.)	Northing (ft.)	Ref. Point Elevation (ft)	Well Depth (ft)	Screen Interval (ft)	GW Depth (ft) 10/12/98	GW Elevation (ft) 10/12/98
LF08-MW10B	1557504	655385	912.27	39.0	29.8-34.8	23.21	889.06
LF08-MW10C	1557519	655384	911.83	25.0	17.5-22.5	22.38	889.45
LF08-MW11A	1556946	655424	934.37	57.0	49.8 - 54.8	12.91	921.46
LF08-MW11B	1556928	655430	934.95	44.3	31.75 - 42.0	11.95	923.00
LF08-MW11C	1556932	655417	935.18	23.9	12.25 - 22.5	11.04	924.14
LF08-MW12B	1556786	655539	936.03	35.8	26.2 - 33.5	12.80	923.23
LF08-MW12C	1556781	655555	936.16	13.5	6.2 - 11.2	12.88	923.28
LF08-MW13A	1556718	655659	934.01	88.5	76.2 - 86.2	14.78	919.23
LF08-MW13B	1556704	655666	933.22	30.9	18.5 - 28.5	11.75	921.47
LF08-MW13C	1556726	655673	933.48	19.7	7.2 - 17.2	12.11	921.37
LF08-MW14B	1556556	655433	942.45	38.0	24.4 - 28.9	13.18	929.27
LF08-MW14C	1556565	655451	941.75	21.2	7.0 - 17.0	12.02	929.73
LF08-MW15A	1557677	656863	841.67	20.6	6.0 - 11.0	8.60	833.07
LF08-MW15B	1557665	656869	841.98	35.0	16.0 - 31.0	14.50	827.48

Table 2-29
LF10 Groundwater Levels (10/12/98)
Wright-Patterson AFB, Ohio
Page 1 of 2

Well No.	Easting (ft)	Northing (ft)	Ref. Point Elevation (ft)	Well Depth (ft)	Screen Interval (ft)	Depth to Water (ft)	GW Elev 10/12/98 (ft)	Estimated GW Elev (ft)
EW-1001	1558373	655167	908.28	53 0	3.0-53 0	24.40	883.88	
EW-1002	1558408	655241	921.78	53 0	3.0-53 0	52 81	868.97	
EW-1003	1558528	655193	915.81	66.0	6.0-66.0	22.39	893.42	
EW-1004	1558489	655275	923.08	63 0	5 0-63 0	DRY	DRY	860.08
EW-1006	1558419	655401	916 36	38 0	5 0-38 0	SEWAGE	SEWAGE	
EW-1008	1558315	655424	911 05	36 0	6.0-36.0	DRY	DRY	875.05
LF10-MW103	1558594	655461	909.65	42 0	32.0-42 0	34.73	874.92	
LF10-MW104	1558338	655171	909 40	82 0	70.0-80 0	DRY	DRY	827.40
LF10-MW01A	1558263	654535	918.50	106.0	87.0-92.0	75.52	842.98	
LF10-MW01B	1558253	654539	918 52	40.0	27.0-37 0	25.04	893.48	
LF10-MW01C	1558265	654545	918 57	14.0	6.0-11.0	14.92	903 65	
LF10-MW05B	1558089	655302	858.44	37.0	27 0-34.2	20.01	838 43	
LF10-MW05C	1558089	655302	859.06	11.0	3 42-8.42	10 58	848.48	
LF10-MW07A	1558345	655426	897 54	82.0	64 0-69.0	52 29	845 25	
LF10-MW07B	1558338	655437	897.01	36.0	19 3-24.3	29.04	867 97	
LF10-MW07C	1558334	655414	897 72	18.0	9.33-14 33	14 81	882.91	
LF10-MW08A	1559055	656238	863 35	92.2	79.9-89.9	68 06	795.29	
LF10-MW08B	1559110	656062	865.09	18 7	11.5-16.5	11.92	853.17	
01-004-M	1558364	655683	880.58	63.0	33 0 - 63.0	41.42	839 16	
01-005-M	- -	- -	839.72	46.0	35.0 - 46.0	10.08	829.64	
01-DM-101D-M	1558644	655032	914.54	85 0	78.8-83.8	DRY	DRY	829 54
01-DM-101S-M	1558643	655024	914.95	51.8	41.8-51.8	37.31	877 64	
EW-1011	1558561	655724	909.31	66.0	6.0-66.0	18.80	890 51	
EW-1012	1558469	655798	891.43	31.0	4.0-31.0	30.52	860 91	
EW-1013	1558477	655886	886.21	30.0	5.0-30.0	OBSTRUCTED	OBSTR.	
EW-1014	1558518	655958	884.90	30.0	5.0-30 0	DRY	DRY	854 90
EW-1015	1558681	655792	907.94	62.0	6.0-62 0	DRY	DRY	845 94
EW-1016	1558686	655879	907.88	50.5	5.5-50.5	22 30	885 58	
EW-1017	1558732	655979	901.79	48.0	3.0-48.0	45.60	856.19	
EW-1018	1558630	655969	901.77	37 0	2.0-37.0	31.99	869 78	
EW-1019	1558588	656093	884 74	52.0	2.0-52.0	DRY	DRY	832 74
EW-1020	1558723	656335	868 18	35 0	4.0-35.0	33.75	834.43	

Table 2-29
LF10 Groundwater Levels (10/12/98)
Wright-Patterson AFB, Ohio
Page 2 of 2

Well No.	Easting (ft)	Northing (ft)	Ref. Point Elevation (ft)	Well Depth (ft)	Screen Interval (ft)	Depth to Water (ft)	GW Elev 10/12/98 (ft)	Estimated GW Elev (ft)
EW-1022	1558803	656372	871.32	65.0	5.0-65.0	78.57	792.75	
EW-1024	1558794	656041	891.25	41.0	5.0-41.0	39.66	851 59	
EW-1025	1558824	656301	877.61	43.0	3.0-43.0	29.85	847.76	
EW-1026	1558884	656379	861 26	85.0	6.0-85.0	65.14	796 12	
LF10-MW102	1558782	655907	891 25	65.0	55.0-66.0	61.71	829 54	
LF10-MW105	1558522	656189	Unknown	65 0	53.0-63.0	52.20	Unknown	
LF10-MW04A	1559287	655635	898.90	218.0	184.2-194.2	10 88	888.02	
LF10-MW04B	1559284	655638	898 86	126.0	113.65-123.65	98 98	799.88	
LF10-MW04C	1559279	655642	898 87	65.0	56.0-61.0	DRY	DRY	833.87
LF10-MW06A	1558854	655601	894 62	87.1	74.8-84.8	72.63	821.99	
LF10-MW06ADUP	1558844	655603	894 78	66.0	55.0-65.0	67.38	827.40	
LF10-MW06B	1558826	655601	894.09	44.0	37 15-42.50	34.48	859.61	
LF10-MW09A	1558360	656101	877.98	88.0	77.0-87.0	52.08	825.90	
LF10-MW09B	1558357	656119	878.21	61.0	46.4-57.0	DRY	DRY	817.21
LF10-MW09C	1558371	656113	878.17	45.0	31.05-41.10	35.33	842.84	
LF10-MW10A	1558951	656519	844.26	135.0	120.0-130.0	48.13	796.13	
LF10-MW10B	1558964	656516	844.40	26.0	13.75-23 75	DRY	DRY	818.40
LF10-MW10C	1558958	656518	844.19	68.0	56.0-66 0	49.25	794.94	
LF10-MW10D	1558972	656516	843 99	12 0	5 17-10.17	DRY	DRY	831 99
LF10-MW11A	1558415	656399	854 20	74.0	61.7-71.7	30.15	824.05	
LF10-MW11B	1558410	656390	854 52	43.0	30 2-40 2	28.15	826.37	
LF10-MW13A	1558419	656579	845 53	52.0	34.65 - 44.65	21.69	823 84	
LF10-MW13C	1558410	656581	845.64	40.0	17 0 - 27.0	21 83	823.81	
LF10-MW13D	1558430	656578	845 13	12.0	4.67 - 9.67	DRY	DRY	833 13
LF10-MW14A	1558150	653960	948 58	101.0	83.1 - 98.7	73.58	875 00	
01-DM-102D-M	1558748	656591	844.27	98 0	51.5 - 56.5	48 50	795.77	
01-DM-102S-M	1558775	656585	844.88	98 0	17 9 - 22.9	26 17	818.71	

Table 3-1
OU5 Monthly Water Levels for the LTM Program
Wright-Patterson AFB, Ohio

Well No.	Easting (ft)	Northing (ft)	Top of Casing Elevation (ft, MSL)	Total Depth (ft)	10/15/98 Depth to Water (ft)	10/15/98 Water Level Elevation (ft, MSL)	12/9/98 Depth to Water (ft)	12/9/98 Water Level Elevation (ft, MSL)
08-020-M	1554751.74	660587.66	791.12	25.00	22.38	768.74	22.52	768.60
08-021-M	1554787.19	660295.04	791.00	25.00	22.98	768.02	23.35	767.65
08-022-M	1555375.19	660149.93	796.24	36.00	25.99	770.25	25.85	770.39
08-023-M	1555980.09	660959.15	791.94	35.00	9.88	782.06	9.95	781.99
08-524-M	1555179.03	661424.17	790.80	15.40	10.98	779.82	11.15	779.65
08-525-M	1554802.65	661177.01	792.60	16.50	15.65	776.95	15.77	776.83
08-526-M	1554448.02	660846.24	791.50	18.00	Dry	Dry	14.08	777.42
08-527-M	1554422.12	660607.32	789.90	17.00	Dry	Dry	16.85	773.05
08-528-M	1554563.78	660402.24	791.30	18.00	Dry	Dry	Dry	Dry
CW04-60	1554832.90	659865.82	792.07	60.00	24.81	767.26	24.37	767.70
CW04-85	1554820.76	659882.25	790.08	90.00	22.72	767.36	22.30	767.78
CW05-55	1554816.20	660304.19	793.59	104.00	25.47	768.12	26.29	767.30
CW05-85	1554806.12	660331.37	793.85	85.50	25.62	768.23	27.06	766.79
CW06-77	1554784.88	660560.77	790.67	90.00	24.07	766.60	24.21	766.46
CW07-55	**1554794.76**	**661125.12**	791.79	55.00	14.20	777.59	15.76	776.03
CW07-100	**1554784.96**	**661149.04**	791.69	100.00	18.81	772.88	14.09	777.60
CW07-148	**1554799.78**	**661141.45**	791.78	150.00	14.25	777.53	13.92	777.86
CW08-17	**1554701.12**	**661428.50**	788.21	17.25	15.85	772.36	16.05	772.16
CW08-55	**1554697.17**	**661334.50**	787.91	55.00	**13.90**	774.01	13.90	774.01
CW08-110	1554710.68	661423.74	786.81	110.00	**12.78**	774.03	12.72	774.09
HD-10D	1554795.44	659498.14	793.24	73.00	26.42	766.82	25.80	767.44
HD-11	1554695.23	660298.27	791.86	85.00	22.28	769.58	24.70	767.16
HD-12M	1554653.82	660568.71	792.46	83.00	23.92	768.54	24.03	768.43
HD-13S	1554700.94	660074.76	789.55	33.00	22.28	767.27	22.10	767.45
HD-14S	1553908.42	659614.71	790.94	33.00	26.20	764.74	24.75	766.19
EW-1	1554791.95	660312.29	810.42				49.40	761.02

Table 4-1
OU4 Landfill Gas Monitoring Results: October 1998
Wright-Patterson AFB, Ohio

Monitoring Location	Date	CO_2 %	O_2 %	CH_4 %	LEL %
LG-1	04/17/98	1.7	18.6	0	0
	10/14/98	5.9	16.1	0	NM
LG-2	04/17/98	3.7	21.7	0	0
	10/14/98	7 6	13.1	0	NM
LG-3	04/17/98	2 9	22.9	0	0
	10/14/98	3.8	18.4	0	NM
LG-6	04/17/98	2.6	13.7	0	0
	10/14/98	5.1	13.9	0	NM
LG-7	04/17/98	0.8	18.7	0	0
	10/14/98	2.1	18.7	0	NM
LG-8	04/17/98	1.9	18.8	0	0
	10/14/98	4	15 6	0	NM
LG-9	04/17/98	1 8	14	0	0
	10/14/98	4.2	10.4	0	NM
LG-10	04/17/98	8.3	0	1.9	16
	10/14/98	9 2	0	3.1	NM
Bldg. 877 Center	04/17/98	NS	NS	NS	NS
	10/14/98	0	20.3	0	NM
Bldg. 878A NW	04/17/98	NS	NS	NS	NS
	10/14/98	0	20.3	0	NM
Bldg. 878A SE	04/17/98	NS	NS	NS	NS
	10/14/98	0	20.3	0	NM

CO_2 = Carbon dioxide
O_2 = Oxygen
CH_4 = Methane
LEL = Lower Explosive Level
NM = Not measured
NS = Not sampled

Table 5-1
OU4 Monitoring Well Construction Specifications
Wright-Patterson AFB

Well ID	Borehole Diameter (inches)	Borehole Depth (feet)	Well Depth (feet)	Screen Length (feet)	Depth to Screen (feet)	Depth to Sand Pack (feet)	Sand Pack Thickness (feet)	Depth to Seal (feet)	Seal Thickness (feet)
BMP-OU4-01B-60	6.0	60.0	60.0	10.0	50.0	47.5	12.5	44.0	3.5
BMP-OU4-01C-84	6.0	85.0	84.0	10.0	74.0	70.0	15.0	67.0	3.0

Survey Data

Well ID	Northing	Easting	Ground Surface Elevation (ft, MSL)	Monitoring Point Elevation (ft, MSL)
BMP-OU4-01B-60	659355.78	1561892.23	804.85	804.47
BMP-OU4-01C-84	659354.49	1561888.69	804.93	804.44

Table 6-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio
Page 1 of 3

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (usiemens)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)
BS5 P-1	11/4/98	30.4	13	6.66	0.736	208	169 9	6 62	NR
BS5 P-2	11/4/98	31.02	12 3	6.53	0.634	Offscale	364.9	6.87	NR
BS5 P-3	11/4/98	35.56	14.6	6.6	0 742	473	163	5 2	NR
BS5 P-4	11/4/98	35.76	13 4	6 63	0.735	146	152.7	5.83	NR
BS6 P-1	11/4/98	6.03	15.3	6.59	0.611	10	79.1	0.91	NR
BS6 P-2	11/5/98	5.36	14.5	6.55	1.35	213	-102.5	1.98	NR
WP-NEA-MW27-3I	10/28/98	19.09	14.5	6.88	0.825	20	83	5.6	NR
WP-NEA-MW34-2S	10/23/98	11.32	15.2	6.75	0.627	7	146.5	6.27	NR
FTA2 MW02C	10/28/98	14 52	18.1	6.44	0 695	0	-179.6	0 57	NR
LF12 MW15A	10/21/98	8 21	15.5	6.52	0 697	0	14.1	-10	NR
07-520-M	10/21/98	9.61	15.1	6 56	1.08	0	-134.9	5.19	NR
05-DM-123S	10/21/98	7.44	14.7	6 57	0.805	3	7.7	0.76	0.57
05-DM-123I	10/21/98	8.39	14	6.61	0 793	8	-44.9	-0 09	0
05-DM-123D	10/21/98	7.75	14.1	6.6	0.8	1	-160	0.1	1.32
BMP-OU4-1B-60	10/21/98	8.71	14.1	6.53	1 41	-1	-22.6	-10	NR
BMP-OU4-1C-84	10/20/98	8.53	15.5	6 73	1.15	19	-127 9	1.18	NR
OU4-MW-02A	10/20/98	13.25	14.5	6.96	1.15	112	-63.3	11 19	NR
OU4-MW-02B	10/20/98	12.95	13.3	7 07	120	9	36.5	12.75	NR

Table 6-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio
Page 2 of 3

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (usiemens)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)
OU4-MW-03B	10/20/98	14.1	12.9	6.97	1.48	5	84.8	0.47	NR
OU4-MW-03C	10/20/98	13.92	13.2	6.99	1.3	16	120.7	2.17	NR
OU4-MW-04A	10/20/98	14.32	13	6.3	1.39	1	-70.3	1.53	NR
OU4-MW-12B	10/20/98	13.21	14.4	6.62	1.03	0	78 9	1.32	NR
CW05-055	10/23/98	26.55	12.4	6 67	0.92	0	-62.9	0 94	NR
CW05-085	10/21/98	27.13	12.2	7	1.04	0	-84.9	1.76	NR
HD-11	10/28/98	24.55	12.4	6.92	0.99	169	-94.3	0.55	NR
HD-12M	10/28/98	24.1	12.2	6.92	0 98	15	-89.8	0.17	NR
HD-13S	10/26/98	22.45	13.3	7.12	0.98	44	-47.1	6.17	NR
HSA-4A (MW131M)	10/26/98	20.15	12.3	7.06	0.98	24	-96.4	0.24	NR
HSA-4B (MW131S)	10/26/98	NR	13	7.01	0.92	25	-84.1	0.1	NR
HSA-5 (MW132S)	10/26/98	24 35	12	6.99	0 93	0	20.9	0.07	NR
CW3-77	10/21/98	31.31	16 7	6.76	0.543	18	93.8	-0.09	NR
CHP4-MW01	10/16/98	27.63	16.9	6.99	1.55	71	-38	3.25	NR
GR-330	10/16/98	33.09	14.2	7.01	0.97	13	9 3	2.93	NR
GR-333	10/27/98	15.35	16	6.52	0.859	31	4.8	6	NR
GR-334	10/28/98	14.62	15	6.56	0.603	0	-104 7	0.27	NR
OU10-MW-06D	10/23/98	29.29	14.1	5.15	0 94	23	413.1	8 5	NR

Table 6-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (usiemens)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)
OU10-MW-06S	10/23/98	27.45	14.9	4 56	0.827	55	107.7	3.82	NR
OU10-MW-11D	10/20/98	12.23	14.2	6.6	0.833	3	181 8	0.77	0.04
OU10-MW-11S	10/20/98	11.37	14.3	6.42	0.82	3	214 2	3.3	0.02
OU10-MW-19D	10/20/98	34 44	14.8	6.66	0.916	0	173.2	4.13	0
OU10-MW-21S	10/27/98	8.1	15.5	6.57	0 736	4	81	1.46	NR
OU10-MW-25S	10/20/98	27.8	15.1	6.72	0.765	0	76.3	-2.48	NR
WP-NEA-MW37-1D	10/16/98	11	18.9	7.07	0.665	105	-112.4	8.77	0.22
23-578-M	10/29/98	31.82	15.1	6.62	1.59	31	94.8	6.11	NR

BTP - Below top of pump
DO - Dissolved Oxygen
NA - Not available
NR - No reading
ORP - Oxygen Reduction Potential

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio

Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	PCE (ug/L)
	MCL		**5**	**5**	**70**	**5**	**2**	**5**
BS5 P-1	BS5	4-Jun-97	ND	ND	ND	ND	ND	ND
		4-Nov-98	ND	ND	ND	0.41J	ND	1 5=
BS5 P-2	BS5	4-Jun-97	ND	ND	ND	ND	ND	ND
		4-Nov-98	ND	ND	ND	ND	ND	ND
BS5 P-3	BS5	6-Jun-97	ND	ND	ND	ND	ND	(23=)
		4-Nov-98	ND	ND	ND	0.27J	ND	(29=)
		(Dup.)	ND	ND	ND	0 30J	ND	(33=)
BS5 P-4	BS5	6-Jun-97	ND	ND	ND	ND	ND	(29=)
		4-Nov-98	ND	ND	ND	0 34J	ND	(33=)
BS6 P-1	BS6	5-Jun-97	ND	ND	ND	ND	ND	ND
		4-Nov-98	ND	ND	ND	ND	ND	ND
BS6 P-2	BS6	5-Jun-97	ND	ND	ND	ND	ND	ND
		5-Nov-98	ND	ND	ND	ND	ND	ND
WP-NEA-MW27-3I	OU2 (OU10)	30-Mar-93	ND	ND	ND	ND	ND	(21 =)
		25-Aug-93	ND	ND	ND	ND	ND	(22 =)
		7-Dec-93	ND	ND	ND	ND	ND	(20 =)
		27-Apr-98	ND	ND	ND	0 17 J	ND	(26 =)
		28-Oct-98	ND	ND	ND	ND	ND	(18 =)
WP-NEA-MW34-2S	OU2	15-Dec-92	ND	ND	ND	(15 =)	ND	ND
		26-Apr-93	ND	ND	ND	ND	ND	ND
		23-Apr-98	ND	ND	ND	ND	ND	ND
		23-Oct-98	ND	ND	ND	ND	ND	ND
FTA2 MW02C	OU3	13-Jul-93	(6 =)	ND	ND	ND	ND	ND
		24-Jan-94	2 =	ND	ND	ND	ND	ND
		23-Apr-98	ND	ND	ND	ND	ND	ND
		28-Oct-98	ND	ND	ND	ND	ND	ND
LF12 MW15A	OU3	6-Jul-93	ND	ND	ND	12.11=	ND	ND
		10-Jan-94	ND	ND	ND	1 0=	ND	ND
		21-Oct-98	ND	ND	0 57 J	1 8 =	ND	ND
07-520-M	OU3	1-Jul-93	ND	ND	ND	ND	ND	ND
		1-Jun-94	ND	ND	0 3J	ND	ND	ND
		21-Oct-98	ND	ND	0 21J	ND	ND	ND

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio
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Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chlonde (ug/L)	PCE (ug/L)
	MCL		5	5	70	5	2	5
05-DM-123S	OU3	13-Jul-93	ND	ND	ND	2=	ND	ND
		11-Jan-94	ND	ND	ND	2=	ND	ND
		14-Apr-94	ND	ND	ND	2=	ND	ND
		31-Aug-94	ND	ND	ND	2=	ND	ND
		21-Oct-98	ND	ND	0 85J	2.2=	ND	ND
05-DM-123I	OU3	26-Jul-93	ND	ND	ND	2=	ND	ND
		11-Jan-94	ND	ND	ND	2=	ND	ND
		14-Apr-94	ND	ND	ND	2=	ND	ND
		31-Aug-94	ND	ND	ND	2.2=	ND	ND
		21-Oct-98	ND	ND	0 48J	2 7=	ND	ND
05-DM-123D	OU3	22-Jul-93	ND	ND	ND	ND	ND	ND
		11-Jan-94	ND	ND	ND	ND	ND	ND
		14-Apr-94	ND	ND	ND	ND	ND	ND
		31-Aug-94	ND	ND	ND	ND	ND	ND
		21-Oct-98	ND	ND	ND	1 6	ND	ND
BMP-OU4-1B-60	OU4	21-Oct-98	ND	ND	3.1 =	4.5 =	0 5 J	ND
BMP-OU4-1C-84	OU4	20-Oct-98	ND	ND	ND	ND	ND	ND
OU4-MW-02A	OU4	22-Jul-93	ND	ND	ND	2 =	ND	ND
		26-Aug-93	ND	ND	ND	4 =	ND	ND
		15-Dec-93	ND	ND	ND	(5 =)	ND	ND
		23-Apr-98	ND	ND	4 4 =	0 56 J	ND	ND
		20-Oct-98	ND	ND	7 1 =	1 7 =	ND	ND
OU4-MW-02B	OU4	15-Dec-93	ND	ND	ND	(23 =)	ND	ND
		26-Aug-93	ND	ND	ND	(22 =)	ND	ND
		23-Apr-98	ND	ND	0.74 J	(21 =)	ND	ND
		20-Oct-98	ND	ND	0 69 =	(16 =)	ND	ND
OU4-MW-03B	OU4	24-Aug-93	ND	ND	ND	(17 =)	ND	ND
		15-Dec-93	ND	ND	ND	(16 =)	ND	ND
		21-Apr-98	ND	ND	0.61 J	(12 =)	ND	ND
		20-Oct-98	ND	ND	0.61 =	(10 =)	ND	ND
OU4-MW-03C	OU4	24-Aug-93	ND	ND	ND	(22 =)	ND	ND
		14-Dec-93	ND	ND	ND	(24 =)	ND	ND
		21-Apr-98	ND	ND	0 96 J	(21 =)	ND	ND
		20-Oct-98	ND	ND	1 0 =	(15 =)	ND	ND

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio

Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	PCE (ug/L)
	MCL		**5**	**5**	**70**	**5**	**2**	**5**
OU4-MW-04A	OU4	22-Jul-93	ND	ND	ND	ND	0.5 J	ND
		23-Aug-93	ND	ND	ND	ND	ND	ND
		13-Dec-93	ND	ND	ND	ND	(2 =)	ND
		23-Apr-98	ND	ND	ND	ND	ND	ND
		20-Oct-98	ND	ND	ND	ND	ND	ND
OU4-MW-12B	OU4	26-Aug-93	ND	ND	ND	(12 =)	ND	ND
		15-Dec-93	ND	ND	ND	(14 =)	ND	ND
		23-Apr-98	ND	ND	0 70 J	(11 =)	ND	1 2 =
		20-Oct-98	ND	ND	1.1 =	(9 =)	ND	2 5 =
CW05-055	OU5	25-Oct-93	ND	ND	2=	(8 4=)	ND	ND
		7-Mar-94	ND	ND	29 7=	(6 8=)	2=	ND
		23-Oct-98	ND	ND	19.7=	(6 1=)	ND	ND
CW05-085	OU5	25-Oct-93	ND	ND	25 6=	(316 5=)	ND	ND
		14-Feb-94	ND	ND	12=	(360=)	ND	ND
		21-Oct-98	ND	ND	10=	(83=)	ND	ND
HD-11	OU5	28-Oct-98	ND	ND	30.5J	(51=)	ND	ND
HD-12M	OU5	28-Oct-98	ND	ND	ND	1.3=	ND	ND
HD-12S	OU5	28-Oct-98	Dry					
HD-13S	OU5	26-Oct-98	ND	ND	17 30J	0.28J	1 5=	ND
HSA-4A (MW131M)	OU5	11-Oct-93	ND	ND	23=	(190=)	ND	ND
		24-Feb-94	ND	0 7J	50=	(66=)	ND	ND
		26-Oct-98	ND	ND	~~50 4 J~~ 52.4 J	~~1 0=~~ 1 2 =	~~3.4=~~ (4 2 =)	ND
HSA-4B (MW131S)	OU5	2-Nov-93	ND	ND	ND	(14.5=)	ND	(6.7=)
		23-Feb-94	ND	ND	ND	(9 8=)	ND	(6 3=)
		26-Oct-98	ND	ND	2.0=	3.1=	ND	1 5=
HSA-5 (MW132S)	OU5	2-Nov-93	ND	ND	ND	(20.6=)	ND	(12 1=)
		23-Feb-94	ND	ND	1 2J	(25 2=)	ND	(10 5=)
		26-Oct-98	ND	ND	ND	ND	ND	ND
	Dup	26-Oct-98	ND	ND	0 55 =	(33 =)	ND	(7 3 =)
CW03-77	OU8	19-Aug-93	ND	ND	ND	2=	ND	ND
		29-Oct-93	ND	ND	1=	(8=)	ND	ND
		6-Apr-94	ND	ND	1=	(9=)	ND	ND
		25-Aug-94	ND	ND	ND	(7 4=)	ND	ND
		21-Oct-98	ND	ND	0 28 J	3 7 =	ND	1 1 =

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio
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Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	PCE (ug/L)
	MCL		**5**	**5**	**70**	**5**	**2**	**5**
CHP4-MW01	OU10	5-Dec-95	ND	ND	ND	(8=)	ND	(5 =)
		22-Apr-98	ND	ND	ND	4.5 =	ND	4 7 =
		16-Oct-98	ND	ND	ND	2.1 =	ND	2 5 =
GR-330	OU10	1-Sep-93	ND	ND	ND	ND	ND	(20 =)
		3-Nov-93	ND	ND	ND	ND	ND	(13 =)
		7-Apr-94	ND	ND	ND	ND	ND	(22 =)
		30-Aug-94	ND	ND	ND	ND	ND	(37 =)
		7-Dec-95	ND	ND	ND	ND	ND	(16 =)
		24-Apr-98	ND	ND	ND	ND	ND	(43 =)
		16-Oct-98	ND	ND	ND	ND	ND	(30 =)
GR-333	OU10	3-Apr-93	ND	ND	ND	(5 =)	ND	ND
		30-Aug-93	ND	ND	ND	(6 =)	ND	ND
		9-Dec-93	ND	ND	ND	(6 =)	ND	ND
		13-Apr-94	ND	ND	ND	(6 =)	ND	ND
		22-Apr-98	ND	ND	ND	(6.1 =)	ND	0.58 J
		27-Oct-98	ND	ND	ND	4 9 =	ND	0 68 =
GR-334	OU10	3-Apr-93	ND	ND	ND	ND	ND	ND
		13-Apr-94	ND	ND	ND	ND	ND	ND
		30-Aug-94	ND	ND	ND	(7 =)	ND	ND
		22-Apr-98	ND	ND	ND	ND	ND	ND
		28-Oct-98	ND	ND	ND	ND	ND	ND
WP-NEA-MW37-1D	OU10	27-Aug-93	(7 =)	ND	ND	ND	ND	ND
		13-Dec-93	ND	ND	ND	ND	ND	ND
		23-Apr-98	ND	ND	ND	ND	ND	ND
		16-Oct-98	ND	ND	ND	ND	ND	ND
OU10-MW-06S	OU10	6-Oct-94	ND	ND	ND	2 =	ND	ND
		13-Jan-95	ND	ND	ND	(10 =)	ND	ND
		24-Apr-98	ND	ND	ND	(13 =)	ND	ND
		23-Oct-98	ND	ND	ND	(14 =)	ND	ND
OU10-MW-06D	OU10	06-Oct-94	ND	ND	ND	ND	ND	(20 =)
		13-Jan-95	ND	ND	ND	ND	ND	(10 =)
		20-Apr-98	ND	ND	ND	ND	ND	2 6 =
		23-Oct-98	ND	ND	ND	ND	ND	ND
OU10-MW-11S	OU10	05-Oct-94	ND	ND	ND	ND	ND	(10 =)
		10-Jan-95	ND	ND	ND	ND	ND	(11 =)
		27-Apr-98	ND	ND	ND	ND	ND	(12 =)
		20-Oct-98	ND	ND	ND	0 39 J	ND	(12 =)

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio
Page 5 of 5

Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	PCE (ug/L)
	MCL		**5**	**5**	**70**	**5**	**2**	**5**
OU10-MW-11D	OU10	05-Oct-94	ND	ND	ND	(6 =)	ND	ND
		10-Jan-95	ND	ND	ND	(7 =)	ND	ND
		23-Apr-98	ND	ND	ND	3 0 =	ND	0 65 J
		20-Oct-98	ND	ND	ND	(10 =)	ND	0 92 =
OU10-MW-19D	OU10	06-Oct-94	ND	ND	ND	(7 =)	ND	ND
		11-Jan-95	ND	ND	ND	(6 =)	ND	ND
		24-Apr-98	ND	ND	ND	(7 1 =)	ND	ND
		20-Oct-98	ND	ND	ND	(5.7 =)	ND	ND
OU10-MW-21S	OU10	05-Oct-94	ND	ND	ND	(9 =)	ND	ND
		12-Jan-95	ND	ND	ND	(7 =)	ND	ND
		23-Apr-98	ND	ND	ND	(10 =)	ND	ND
		27-Oct-98	ND	ND	ND	(9 4 =)	ND	ND
OU10-MW-25S	OU10	08-Oct-94	ND	ND	ND	ND	ND	(19 =)
		12-Jan-95	ND	ND	ND	ND	ND	(22 =)
		24-Apr-98	ND	ND	ND	ND	ND	(19 =)
		20-Oct-98	ND	ND	ND	ND	ND	(18 =)
23-578-M	OU10	1-Nov-93	ND	ND	ND	(52=)	ND	2=
		14-Apr-94	ND	ND	ND	(28=)	ND	1=
		1-Sep-94	ND	ND	ND	(43=)	ND	2=
		29-Oct-98	ND	ND	ND	ND	ND	ND

( ) - Concentration exceeds MCL
ND - Concentration is below detection limits.
ug/L - micrograms per liter
MCLs - Maximum Contaminant Levels.

1,1,2-TCA - 1,1,2-Trichloroethane
1,1-DCE - 1,1-Dichloroethylene
1,2-DCA - 1,2-Dichloroethane
1,2-DCP - 1,2-Dichloropropane
TCE - Trichloroethylene
PCE - Tetrachloroethylene
1,2-DCE - 1,2-Dichloroethene (Total)
-- - Not reported in USGS BMP Summary Report, 1993-1994

Table 7-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio
Page 1 of 2

Well Number	Date Sampled	Depth to Water (ft, TOC)	Easting (ft)	Northing (ft)	Aquifer Layer	Easting ROT (ft)	Northing ROT (ft)	Wellhead Elevation (ft, MSL)	Water Elevation (ft, MSL)
BS5 P-1	11/4/98	30 4	1,548,320 00	649,705 15	1	10,484 93	9,890 13	801 74	771 34
BS5 P-2	11/4/98	31 02	1,548,608 99	649,761 25	1	10,738 55	9,740 66	802 34	771 32
BS5 P-3	11/4/98	35 56	1,548,593 42	649,375 78	1	10,471 47	9,462 27	806 86	771 30
BS5 P-4	11/4/98	35 76	1,548,613 09	649,372 38	2	10,483 95	9,446 69	807 03	771 27
BS6 P-1	11/4/98	6 03	1,552,270 39	650,334 83	1	13,860 84	7,744 13	855 20	849 17
BS6 P-2	11/5/98	5 36	1,552,519 87	650,187 69	1	13,950 19	7,468 62	866 88	861 52
WP-NEA-MW27-3I	10/28/98	19 09	1,570,089 11	667,990 53	2	38,905 30	9,160 43	824 92	805 83
WP-NEA-MW34-2S	10/23/98	11 32	1,569,080 05	670,143 01	1	39,575 83	11,441 16	816 60	805 28
FTA2 MW02C	10/28/98	14 52	1,560,325 01	667,077 90	1	30,987 69	14,946 79	804 20	789 68
LF12 MW15A	10/21/98	8 21	1,558,286 19	664,940 40	1	28,044 35	14,696 86	796 20	787 99
07-520-M	10/21/98	9 61	1,558,145 00	665,335 40	1	28,200 34	15,086 26	789 80	780 19
05-DM-123S	10/21/98	7 44	1,558,208 73	664,886 12	1	27,950 37	14,707 54	798 60	791 16
05-DM-123I	10/21/98	8 39	1,558,202 65	664,870 33	1	27,935 36	14,699 74	798 64	790 25
05-DM-123D	10/21/98	7 75	1,558,201 18	664,860 04	1	27,927 44	14,693 01	798 20	790 45
BMP-OU4-1B-60	10/21/98	8 71	1,561,892 23	659,355 78	2	27,044 64	8,124 80	804 47	795 76
BMP-OU4-1C-84	10/20/98	8 53	1,561,888 69	659,354 49	3	27,041 13	8,126 18	804 44	795 91
OU4-MW-02A	10/20/98	13 25	1,562,381 07	659,330 38	1	27,393 93	7,781 86	809 50	796 25
OU4-MW-02B	10/20/98	12 95	1,562,381 69	659,338 29	2	27,399 63	7,787 37	809 34	796 39
OU4-MW-03B	10/20/98	14 1	1,562,192 53	659,158 39	2	27,138 75	7,777 98	810 25	796 15
OU4-MW-03C	10/20/98	13 92	1,562,186 05	659,166 72	3	27,139 42	7,788 51	809 97	796 05
OU4-MW-04A	10/20/98	14 32	1,562,039 28	658,876 25	1	26,837 02	7,668 21	810 50	796 18
OU4-MW-12B	10/20/98	13 21	1,562,509 87	659,391 25	2	27,530 73	7,742 10	808 00	794 79
CW05-055	10/23/98	26 55	1,554,816 20	660,304 19	2	22,373 44	13,523 83	794 20	767 65
CW05-085	10/21/98	27 13	1,554,806 12	660,331 37	2	22,383 90	13,550 87	793 86	766 73
HD-11	10/28/98	24 55	1,554,695 23	660,298 27	1	22,278 92	13,599 56	791 50	766 95
HD-12M	10/28/98	24 1	1,554,653 82	660,568 71	2	22,427 10	13,829 54	791 50	767 40
HD-13S	10/26/98	22 45	1,554,700 94	660,074 76	1	22,135 09	13,428 37	789 50	767 05
HSA-4A (MW131M)	10/26/98	20 15	1,554,487 46	660,341 21	2	22,151 76	13,769 39	787 31	767 16
HSA-4B (MW131S)	10/26/98	NR	1,554,473 39	660,335 99	1	22,137 76	13,774 80	788 31	
HSA-5 (MW132S)	10/26/98	24 35	1,553,806 91	659,971 67	1	21,397 19	13,943 57	789 78	765 43
CW3-77	10/21/98	31 31	1,550,780 90	656,905 10	3	17,098 87	13,651 94	791 26	759 95
CHP4-MW01	10/16/98	27 63	1,569,476 05	663,070 59	1	35,186 09	5,881 83	835 11	807 48
GR-330	10/16/98	33 09	1,568,740 00	660,830 00	1	33,150 16	4,691 45	841 80	808 71
GR-333	10/27/98	15 35	1,566,808 22	664,655 74	1	34,238 36	8,836 80	814 57	799 22
GR-334	10/28/98	14 62	1,566,801 08	664,647 46	3	34,227 52	8,835 33	813 95	799 33
23-578-M	10/29/98	31 82	1,569,711 00	662,705 00	1	35,119 81	5,452 34	841 00	809 18

Table 7-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio
Page 2 of 2

Well Number	Date Sampled	Depth to Water (ft, TOC)	Easting (ft)	Northing (ft)	Aquifer Layer	Easting ROT (ft)	Northing ROT (ft)	Wellhead Elevation (ft, MSL)	Water Elevation (ft, MSL)
OU10-MW-06D	10/23/98	29 29	1,568,999 30	667,189 85	3	37,558 53	9,282 88	829 73	800 44
OU10-MW-06S	10/23/98	27 45	1,568,994 90	667,187 17	2	37,553 46	9,283 79	830 07	802 62
OU10-MW-11D	10/20/98	12 23	1,567,705 10	665,985 15	2	35,790 97	9,238 18	812 55	800 32
OU10-MW-11S	10/20/98	11 37	1,567,709 00	665,989 36	2	35,796 68	9,238 75	812 57	801 20
OU10-MW-19D	10/20/98	34 44	1,567,865 30	663,566 36	2	34,308 21	7,320 46	834 32	799 88
OU10-MW-21S	10/27/98	8 1	1,563,497 30	663,808 71	1	31,197 36	10,396 29	804 45	796 35
OU10-MW-25S	10/20/98	27 8	1,570,194 80	667,017 73	1	38,339 85	8,361 81	834 10	806 30
WP-NEA-MW37-1D	10/16/98	11	1,566,365 42	667,460 87	2	35,765 45	11,231 13	811 25	800 25

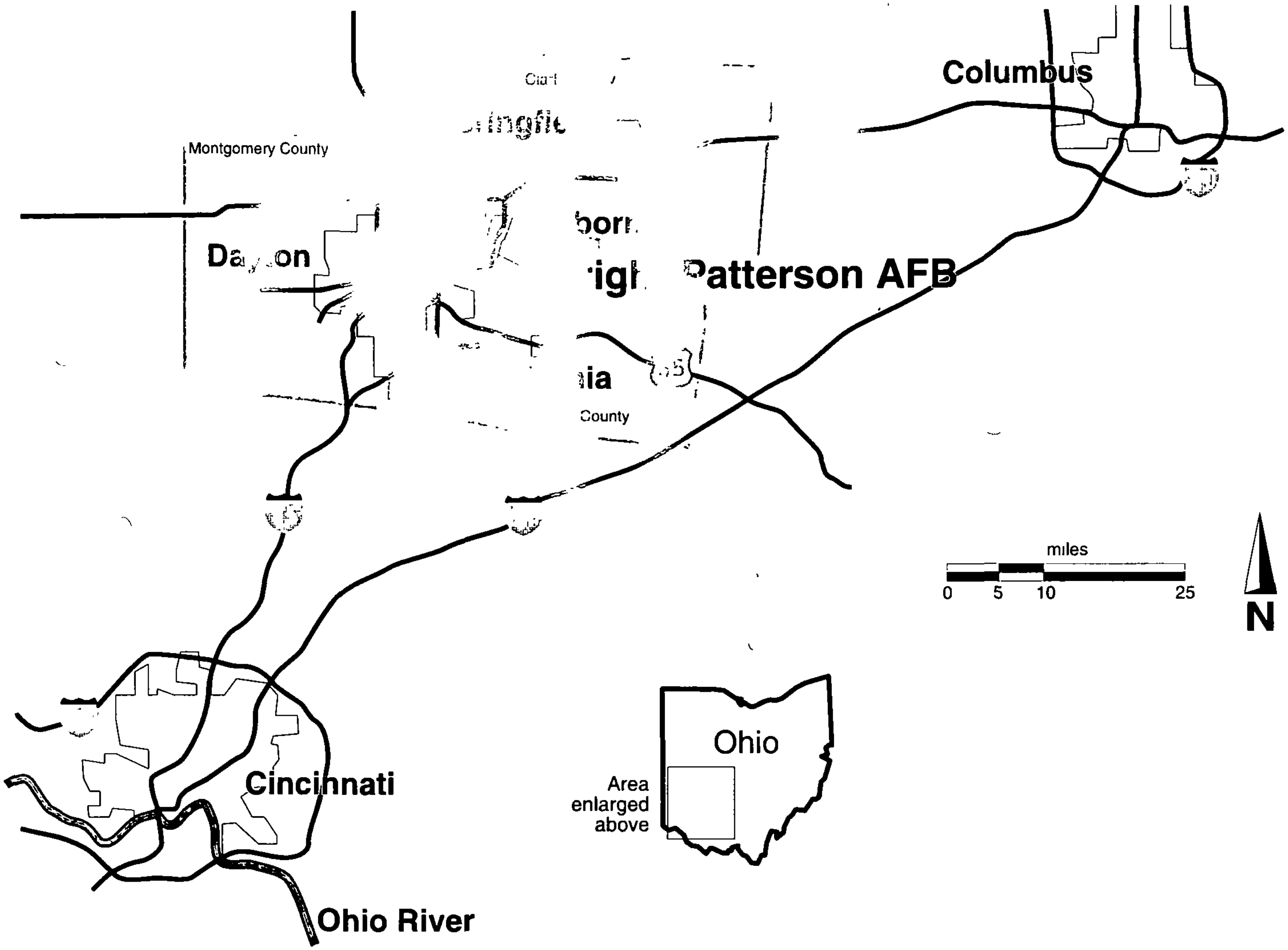

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Figure 1-1. Area Location Map.

Source ES, 1982

DRAWING BY	JJS, III	CHECKED BY	PCM	2/1/95	DRAWING NO.
	4/27/94	APPROVED BY	SWS	2/1/95	S-777097 0108-4/99-4w

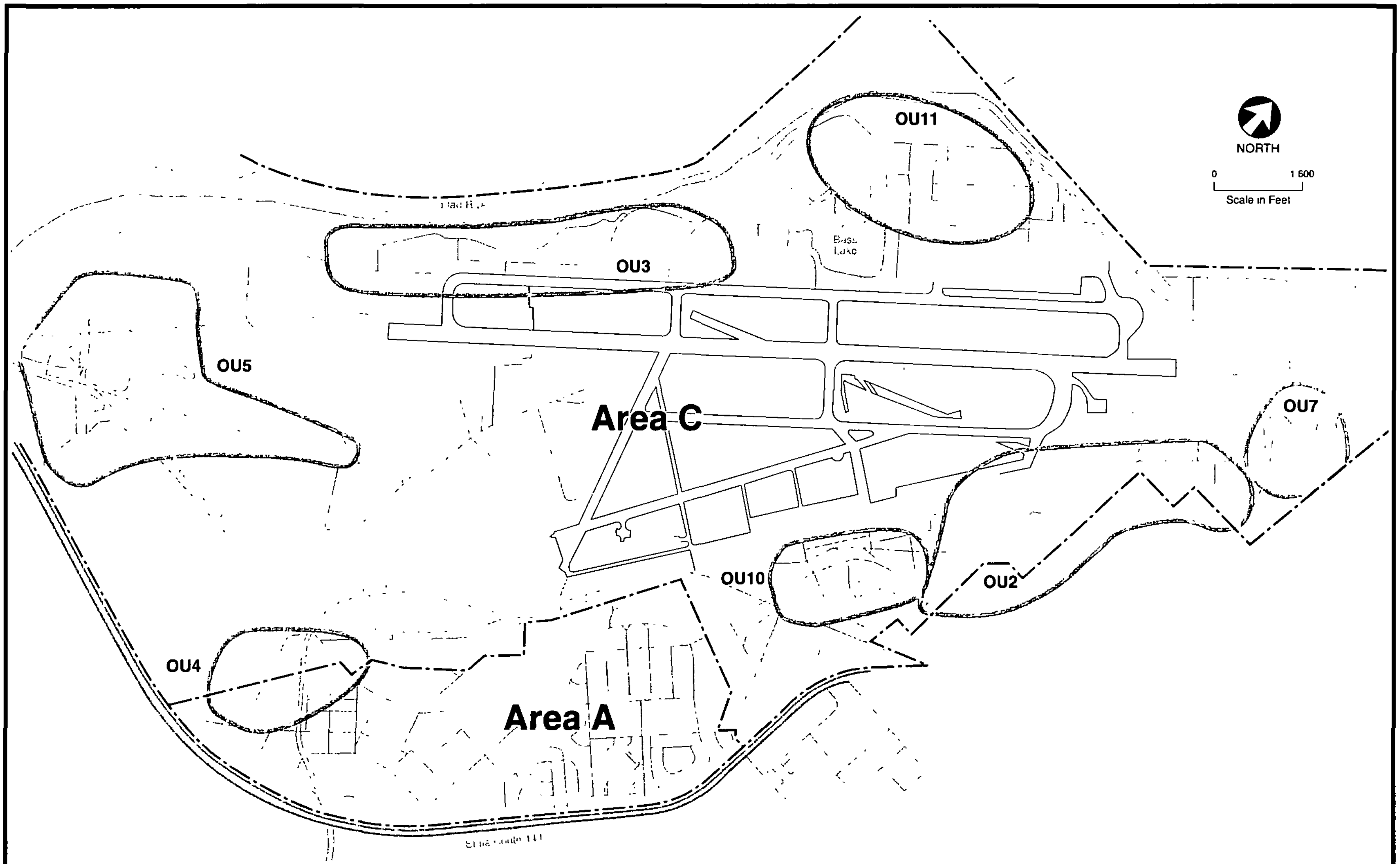

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Figure 1-2. WPAFB OUs - Areas A and C.

Source Map (CH2M Hill, 1994)

DRAWING BY	JIS, III	CHECKED BY	TAC	12/15/98	DRAWING NO.
	12/15/98	APPROVED BY			S-777097 0108-4/99-3w

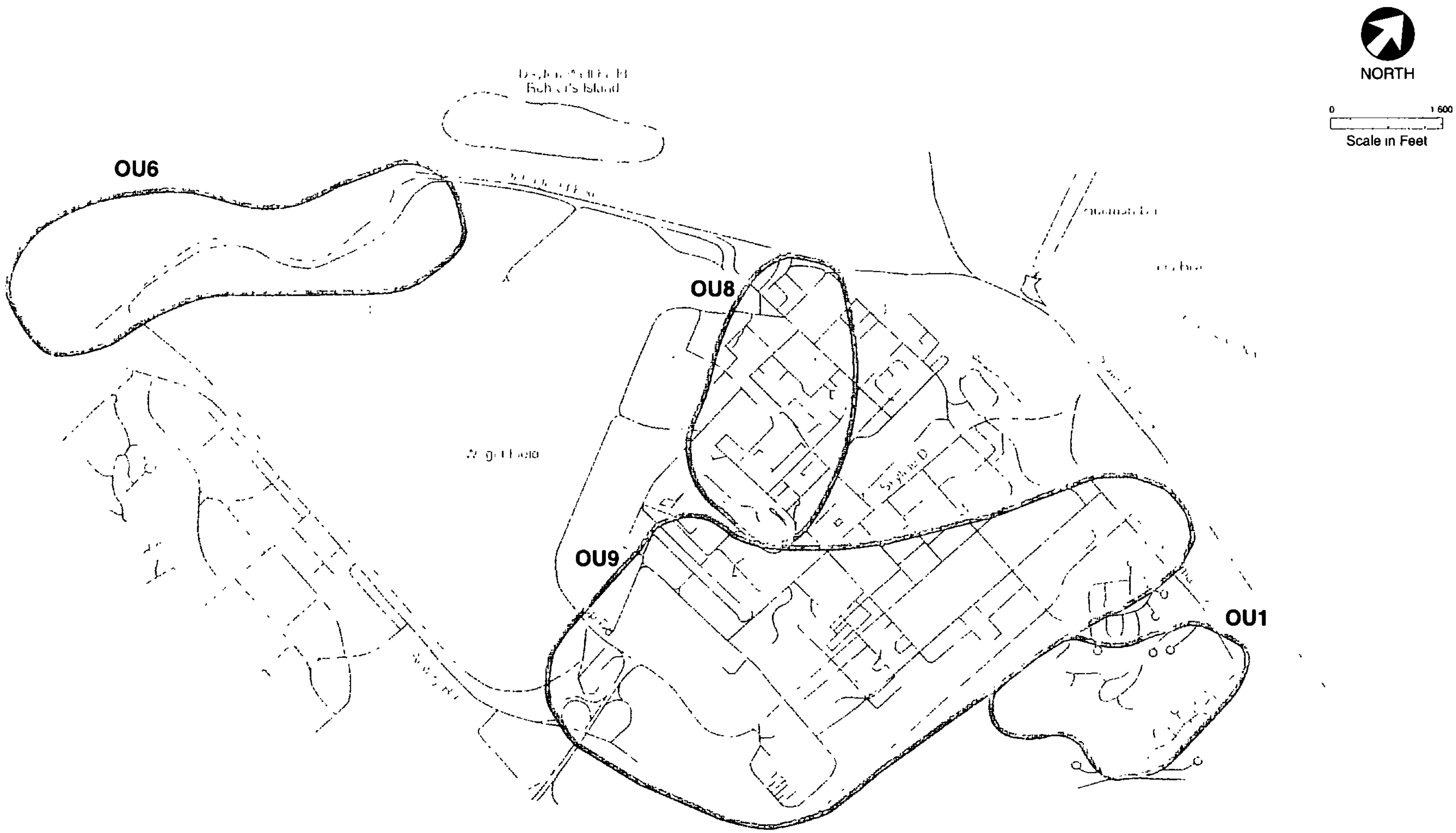

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Figure 1-3. WPAFB OUs - Area B.

Source Map (CH2M Hill, 1994)

DRAWING BY	JIS, III	CHECKED BY	JIS, III	4/21/95	DRAWING NO.
	4/21/95	APPROVED BY	SRS	4/24/95	S-777097 0108-4/99-2w

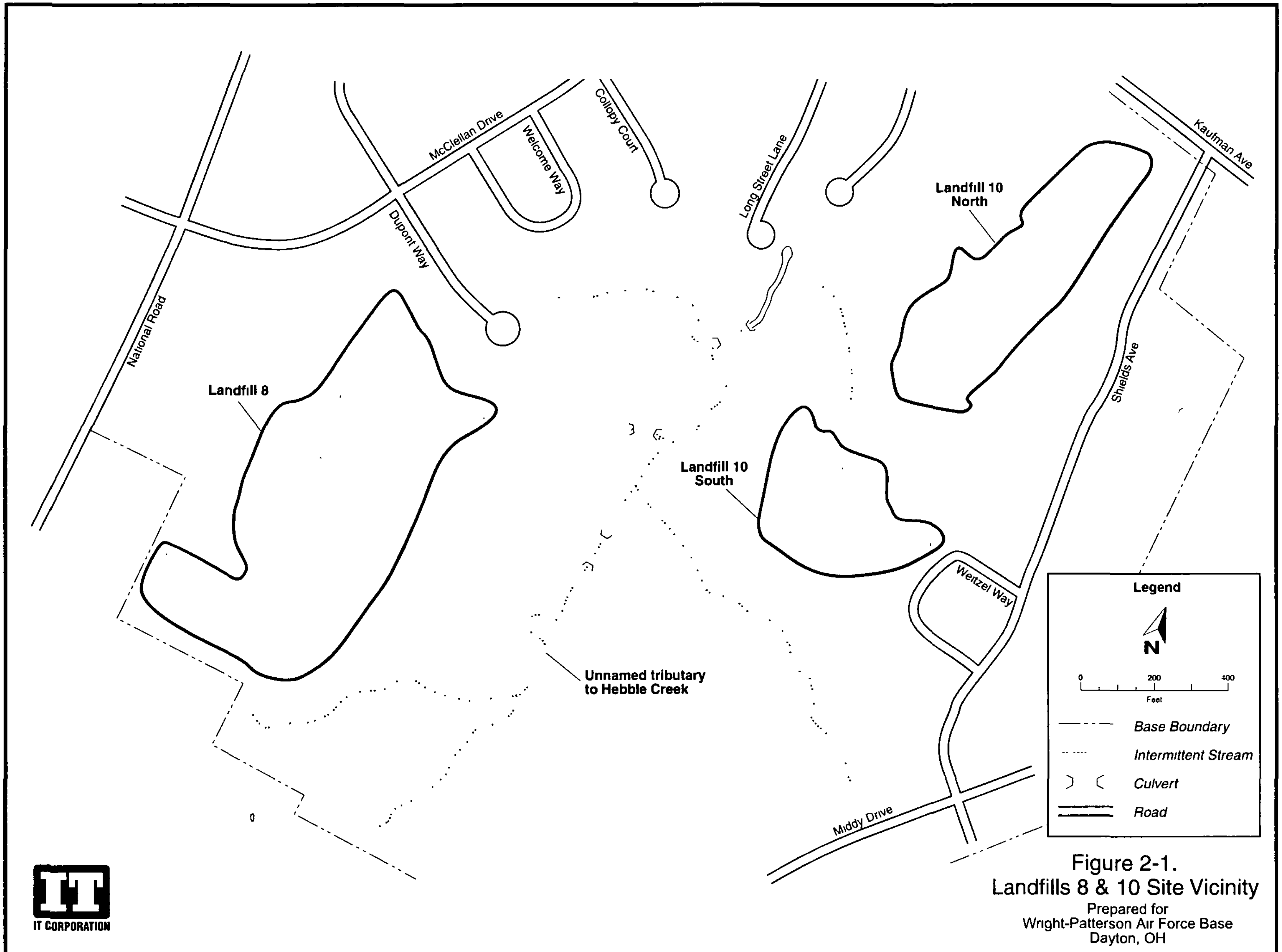

Figure 2-1.
Landfills 8 & 10 Site Vicinity
Prepared for
Wright-Patterson Air Force Base
Dayton, OH

DRAWING BY	JIS, III / 12/9/93	CHECKED BY / APPROVED BY			DRAWING NO. S-777097 0108-4/93-1w

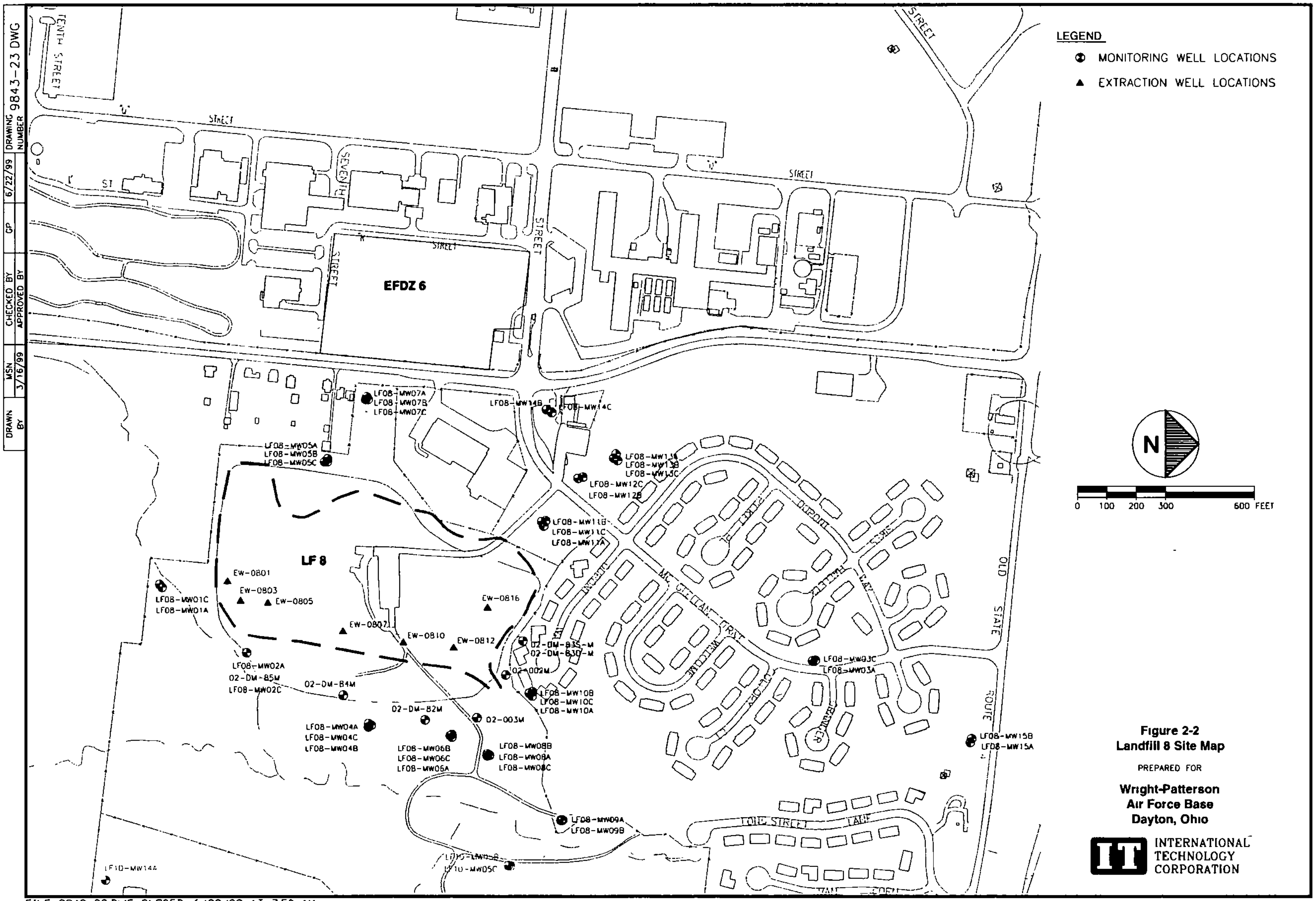

Figure 2-2
Landfill 8 Site Map

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FILE 9843-23 DWG CLOSED 6/22/99 AT 7 50 AM

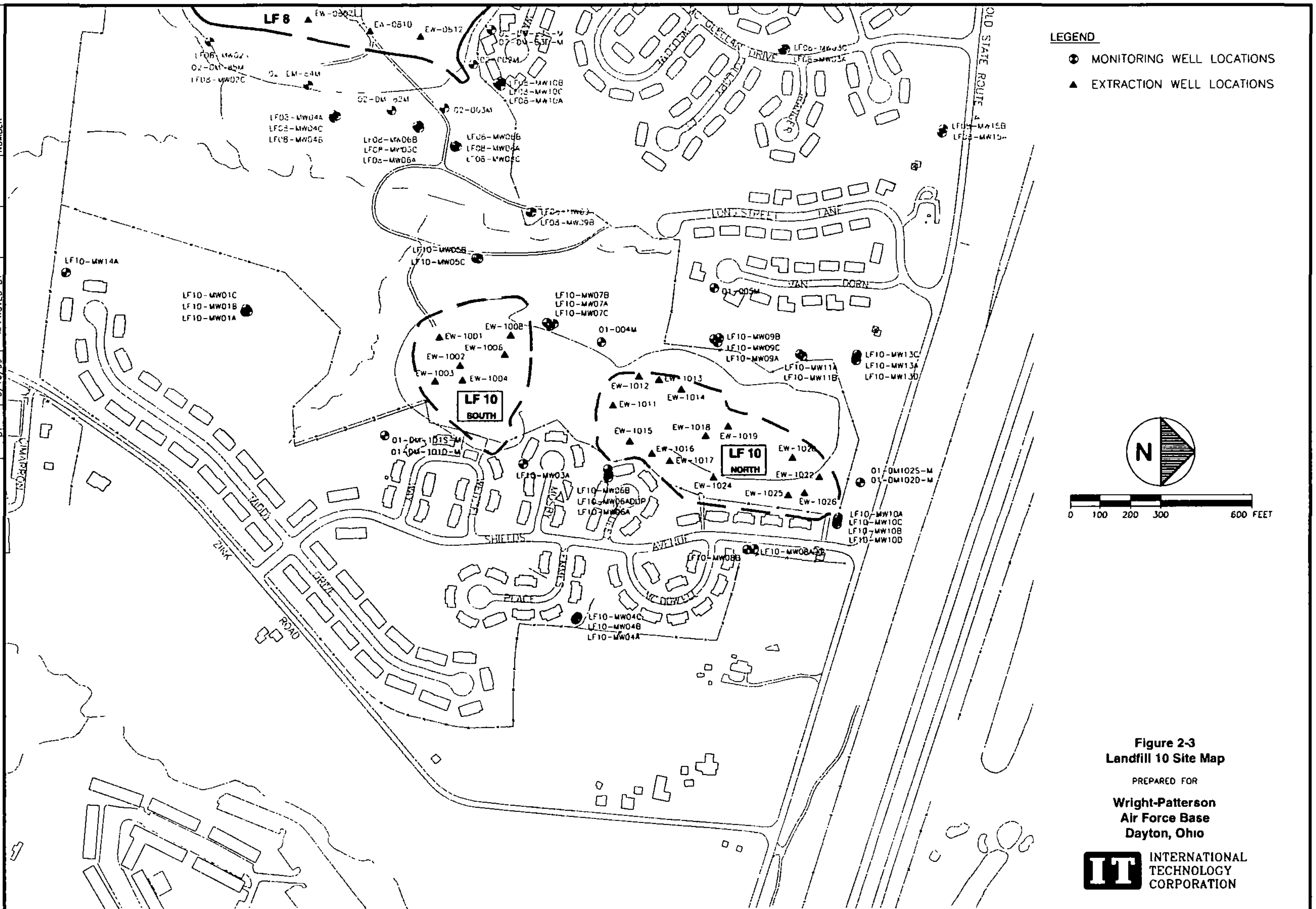

Figure 2-3
Landfill 10 Site Map

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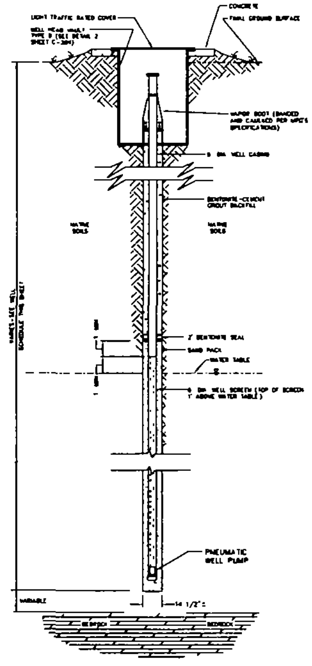
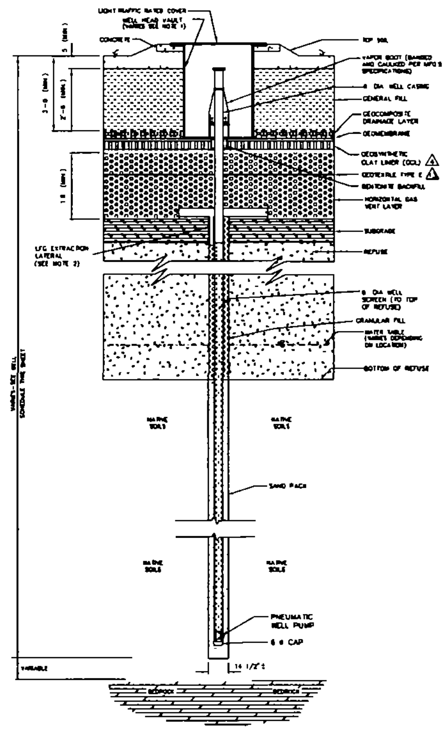
DRAWN BY	3/16/99	MSN	CHECKED BY	APPROVED BY	GP	6/22/99	DRAWING NUMBER	9843-24 DWG

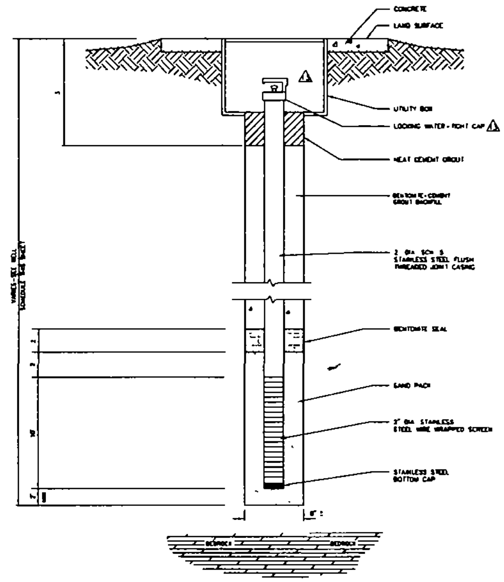
FILE 9843-24 DWG CLOSED 6/22/99 AT 7 53 AM



TYPICAL EXTERIOR LEACHATE COLLECTION WELL
NOT TO SCALE
A / C-302 C-300, C-301



TYPICAL INTERIOR LEACHATE AND GAS COLLECTION WELL
NOT TO SCALE
B / C-302 C-300, C-301 C-200 C-201 E-4



TYPICAL BEDROCK MONITORING WELL
NOT TO SCALE
C / C-302 C-300, C-301

NOTES

1 SEE EXTRACTION WELL SCHEDULE (THIS SHEET) AND SHEETS C-302 AND C-303 FOR DETAILS OF WELL HEAD VAULT TYPES

2 SEE SHEET C-202 FOR DETAIL OF LFG EXTRACTION LATERAL

Revisions			
Symbol	Description	Date	Approved
△	RECORD DRAWING	3/3/96	WHS
△4	SOIL BARRIER LAYER CHANGED TO GEOSYNTHETIC CLAY LINER (GCL)	05/03/95	WHS
△1	ISSUED FOR CONSTRUCTION	10/20/94	WHS
△	ISSUED FOR BID	7/7/94	WHS

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CINCINNATI OHIO

88th AIR BASE WING
OFFICE OF ENVIRONMENTAL MANAGEMENT
WRIGHT-PATTERSON AFB OHIO

Designed by G.A.H.
Drawn by M.S.N.
Checked by J.M.M.
Reviewed by J.M.M.
Approved by W.H.S.

WRIGHT-PATTERSON AFB OHIO
SOURCE CONTROL OPERABLE UNIT
LANDFILLS 8 AND 10

LEACHATE COLLECTION SYSTEM DETAILS
FIGURE 2-4

Scale N.T.S.
Date 7-7-94
Drawing Code
Sheet reference number C-302
Sheet 45 of 75

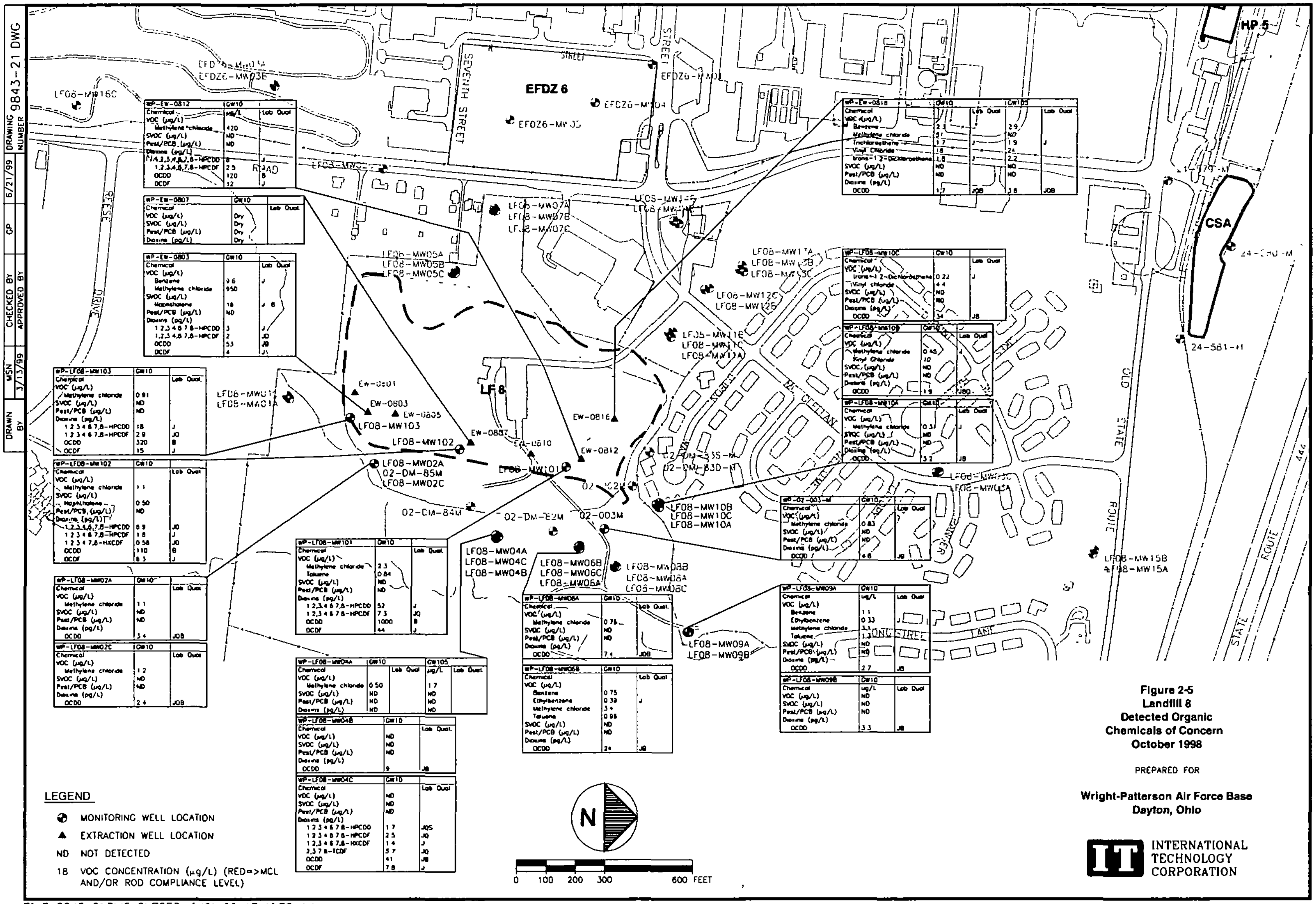

Figure 2-5
Landfill 8
Detected Organic Chemicals of Concern
October 1998

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FILE 9843-21DWG CLOSED 6/21/99 AT 1052 AM

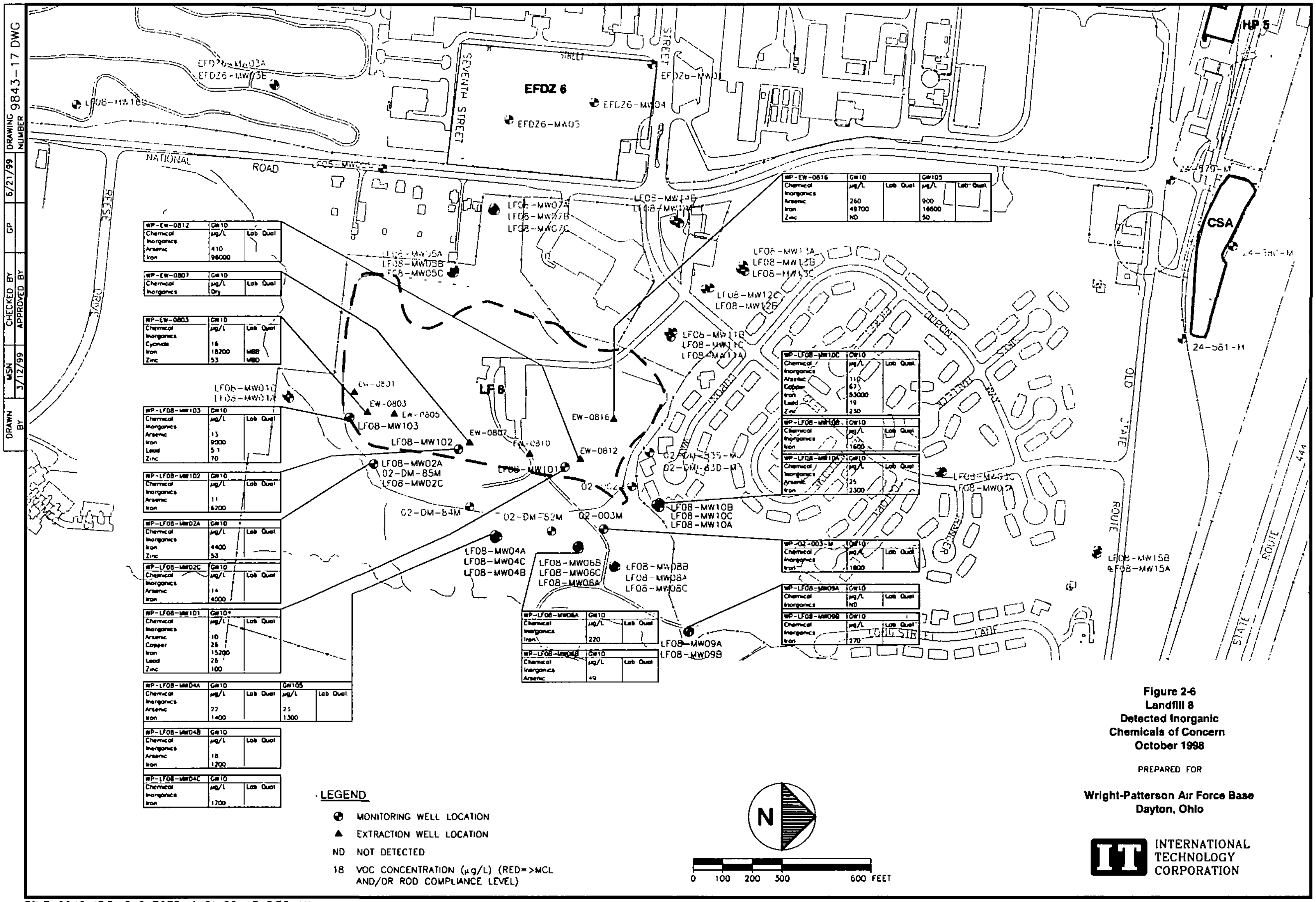

Figure 2-6
Landfill 8
Detected Inorganic Chemicals of Concern
October 1998

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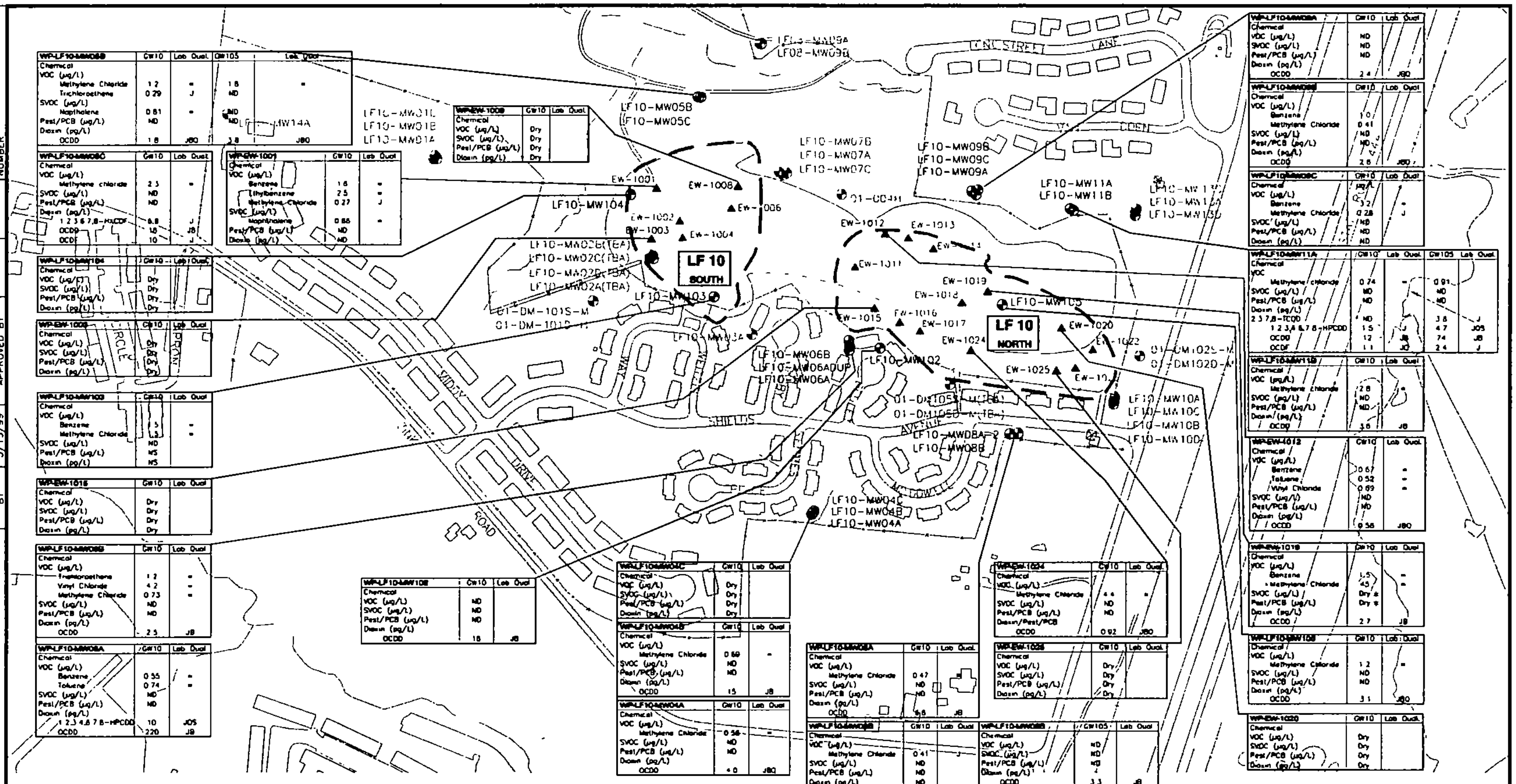
Dayton, Ohio

FILE 9843-17 DWG CLOSED 6/21/99 AT 8 53 AM



LEGEND

- MONITORING WELL LOCATION
- ▲ EXTRACTION WELL LOCATION

ND NOT DETECTED

NS NOT SAMPLED

$pg/L = 1X10^{12}\ \mu g/L$

4 2 VOC CONCENTRATION ($\mu g/L$)(RED=>MCL AND/OR ROD COMPLIANCE LEVEL)

* EXTRACTION WELL EW-1019 WENT DRY DURING SAMPLING

0 100 200 300 600 FEET

Figure 2-7
Landfill 10
Detected Organic
Chemicals of Concern
October 1998

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Dayton, Ohio

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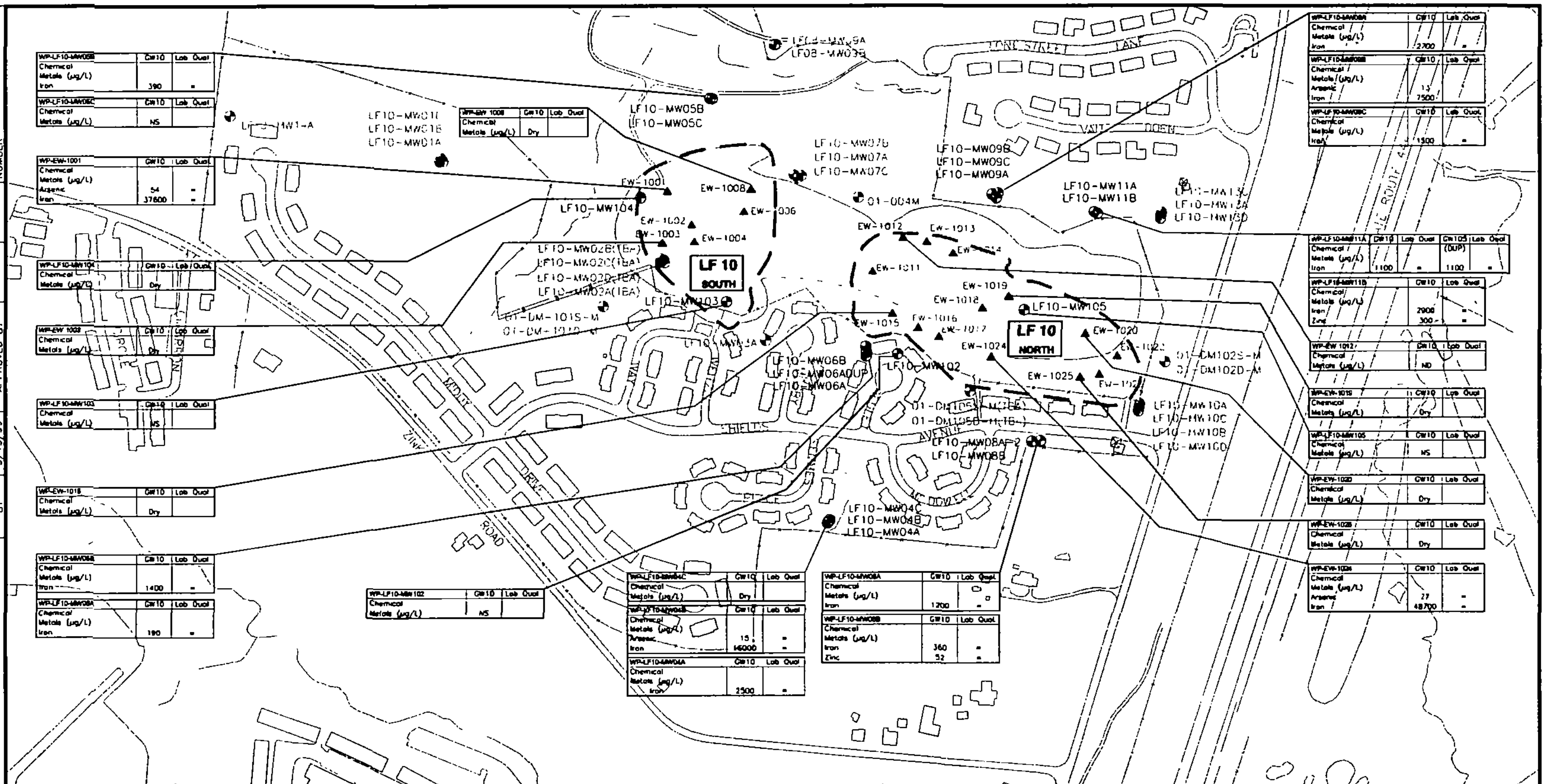
DRAWING NUMBER 9843-19 DWG | 7/15/99 | GP | CHECKED BY APPROVED BY | MSN 3/13/99 | DRAWN BY

FILE 9843-19 DWG CLOSED 7/15/99 AT 12 60 PM



LEGEND

- MONITORING WELL LOCATION
- EXTRACTION WELL LOCATION

ND NOT DETECTED

NS NOT SAMPLED

42 INORGANIC CONCENTRATION (µg/L)(RED=>MCL AND/OR RBD COMPLIANCE LEVEL)

N

0 100 200 300 600 FEET

Figure 2-8
Landfill 10
Detected Inorganic
Chemicals of Concern
October 1998

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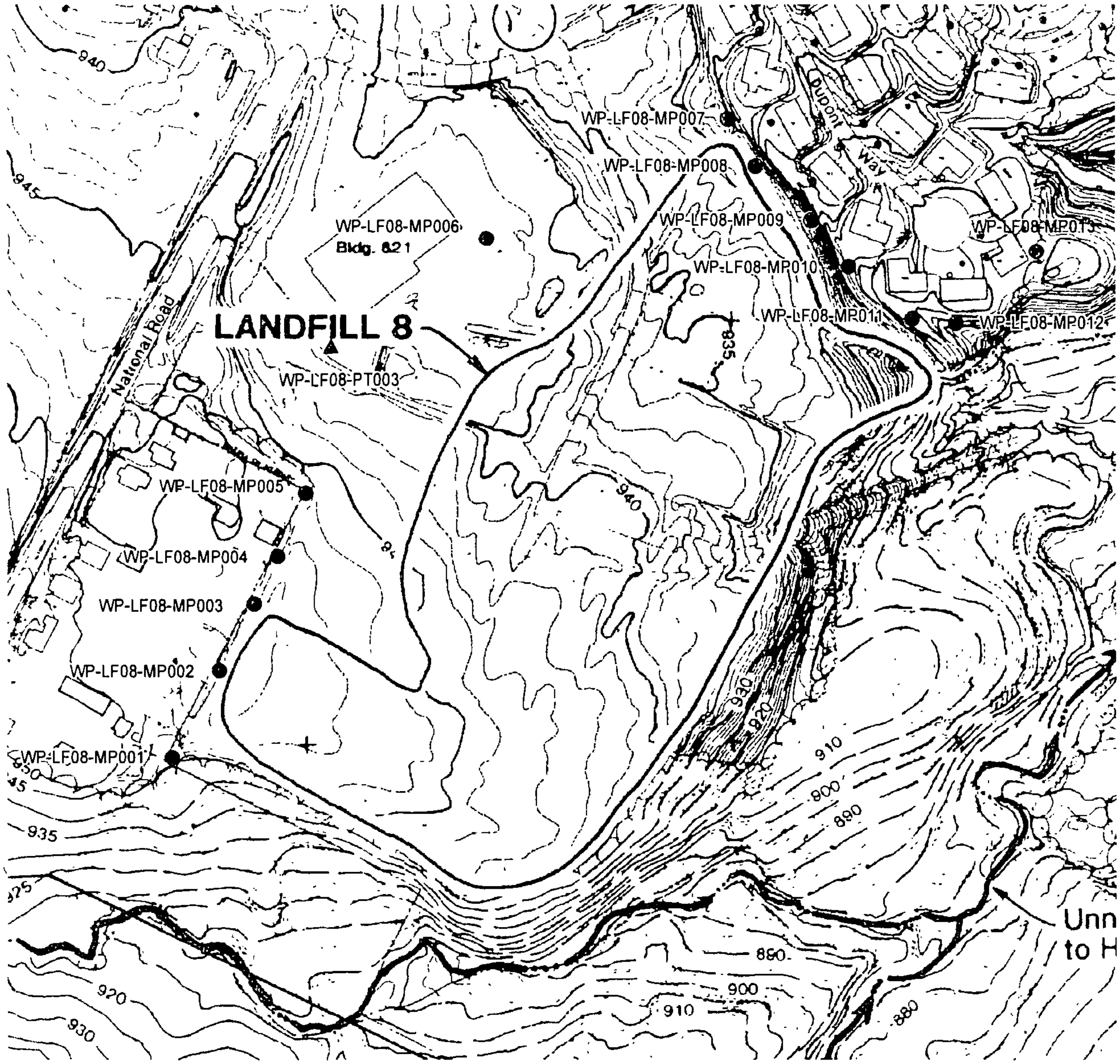
DRAWN BY | MSN 3/13/99 | CHECKED BY | APPROVED BY GP 6/21/99 | DRAWING NUMBER 9843-20 DWG

FILE 9843-20DWG CLOSED 6/21/99 AT 10 39 AM



▲	WP-LF08-PT003	LFG Punchbar Location
●	WP-LF08-MP005	LFG Monitoring Probe Location
⬭		Approximate Landfill Boundary

DRAWING BY	CHECKED BY	APPROVED BY	DRAWING NO
JIS, III 3/29/94	MWC 2/5/01	GDP 2/5/01	S-322505-3-6-4-3/94-2

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Figure 2-9. Landfill 8 Landfill Gas Monitoring Locations

Prepared for
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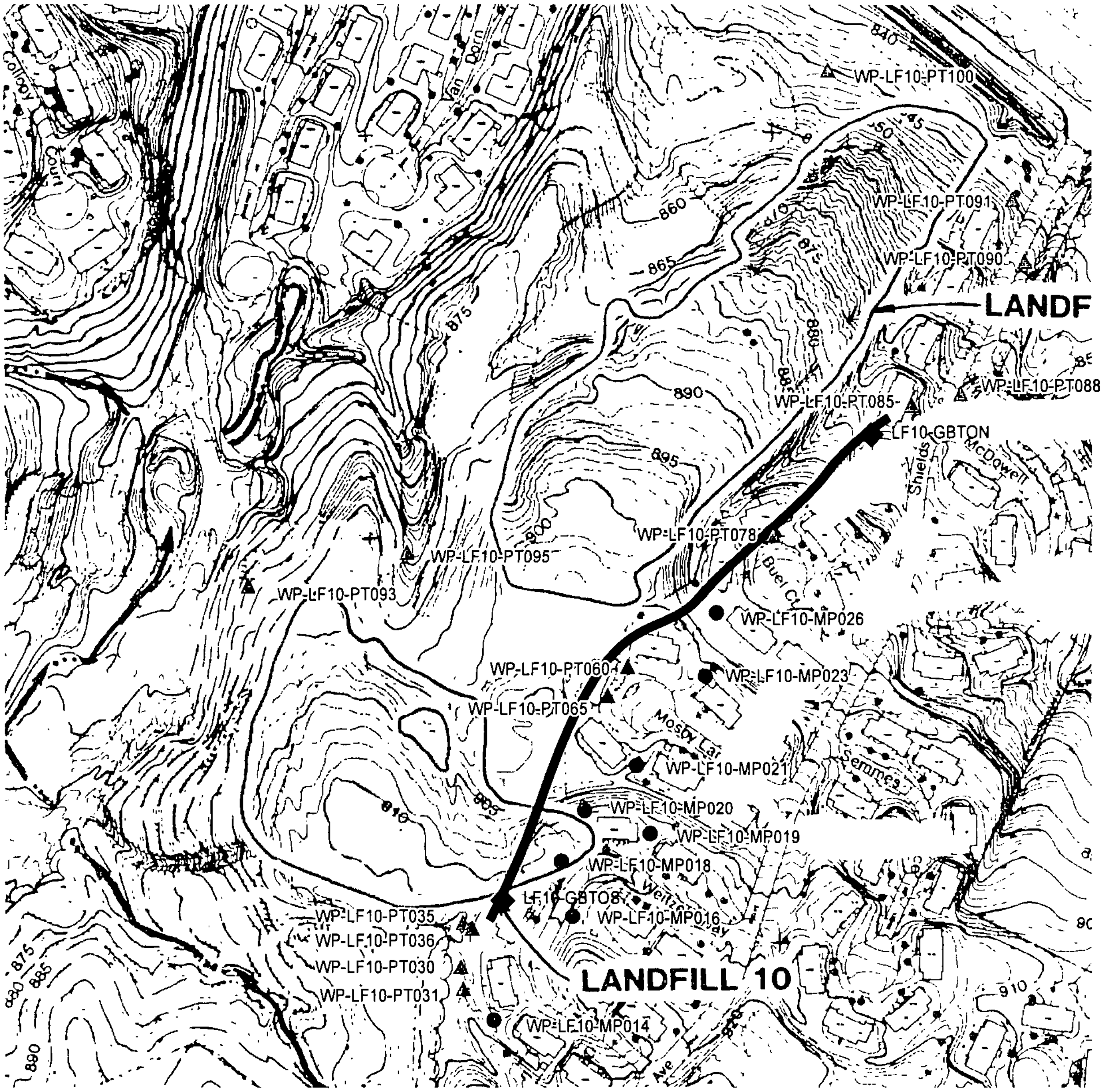
Dayton, Ohio



◆	LF10-GBTOS	Gas Barrier Trench Monitoring Point
▲	WP-LF10-PT100	LFG Punchbar
●	WP-LF10-MP014	LFG Monitoring Probe
▬		Gas Barrier Trench
⬭		Approximate Landfill Boundary

0 100 200
feet

N

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Figure 2-10. Landfill 10 Landfill Gas Monitoring Locations

Prepared for
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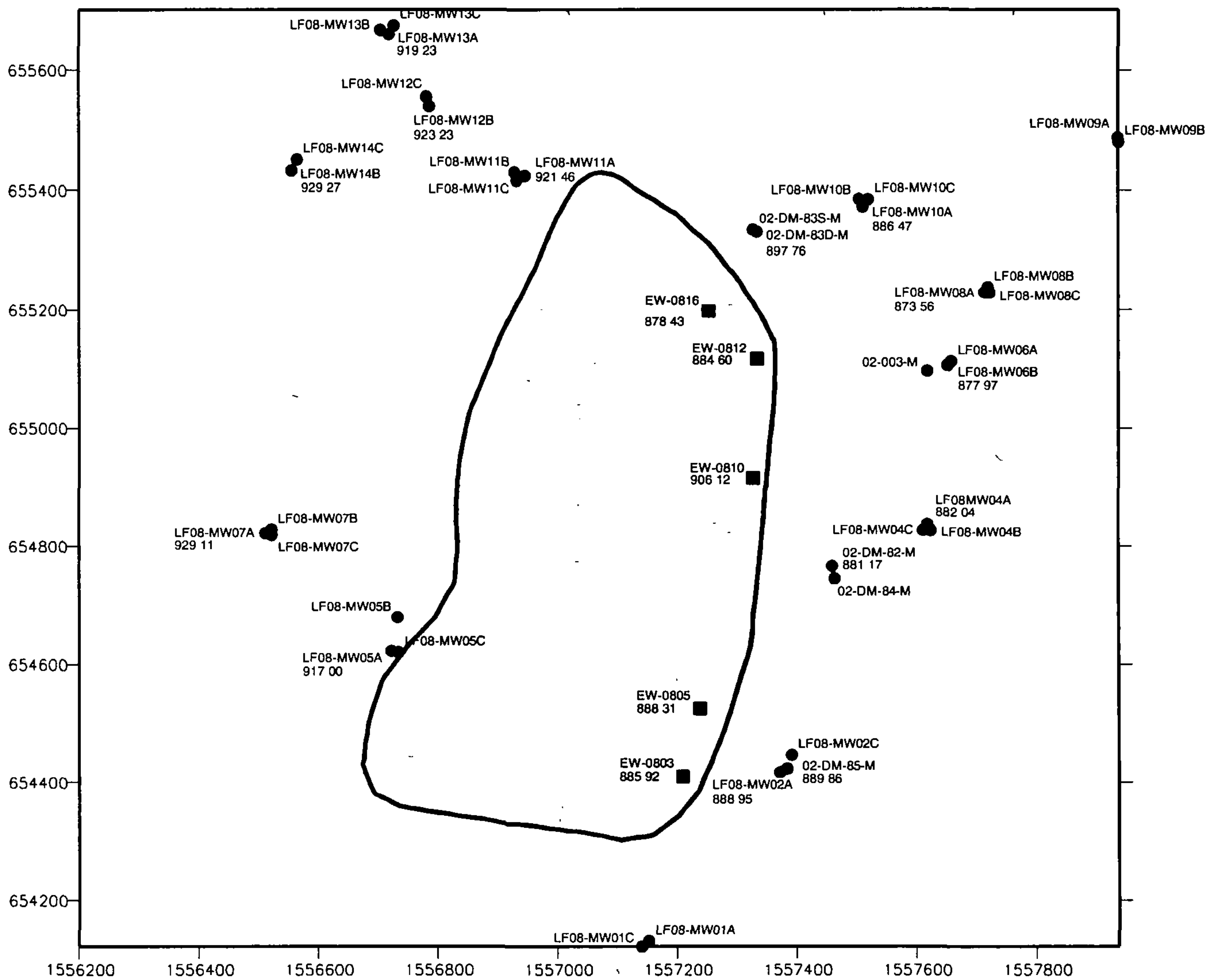
DRAWING NO S-322505-3-6-4-3/94-2

DRAWING BY	JIS,III	3/29/94
CHECKED BY	MWC	2/5/
APPROVED BY	GDP	2/5/0



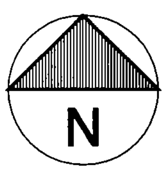


Figure 2-11

Landfill 8
Monitoring and Extraction Wells:
October 12, 1998

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Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

DRAWN BY | MSN 6/22/99 | CHECKED BY | APPROVED BY | GP | 9/9/99 | DRAWING NUMBER 984 | 10 DWG

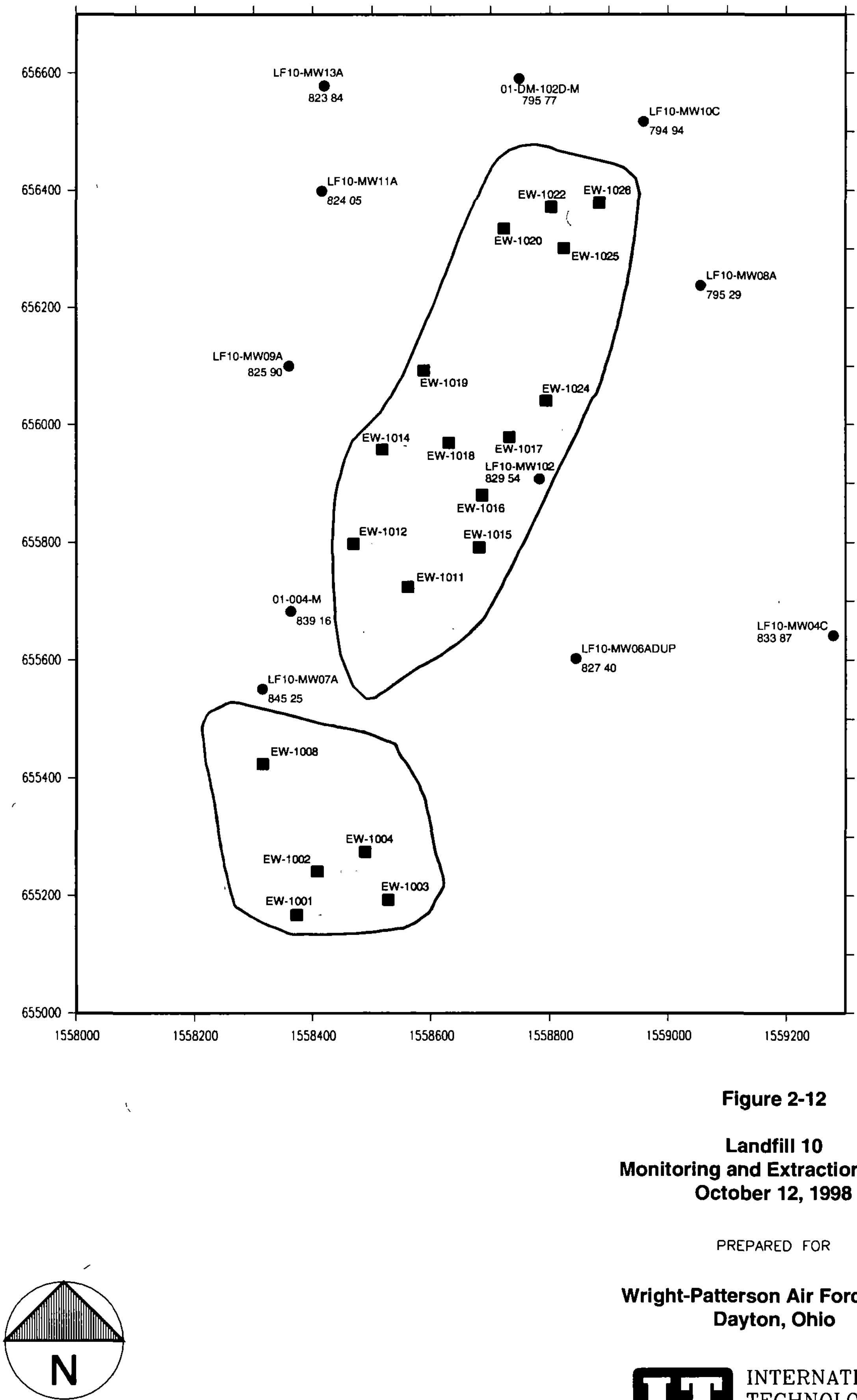

Figure 2-12

Landfill 10
Monitoring and Extraction Wells:
October 12, 1998

PREPARED FOR

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Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

DRAWN BY	MSN 6/22/99	CHECKED BY / APPROVED BY	GP	9/10/99	DRAWING NUMBER 9843-41 DWG

DRAWING NUMBER 984 36 DWG
7/28/99 GP
CHECKED BY
APPROVED BY
MSN 6/22/99
DRAWN BY

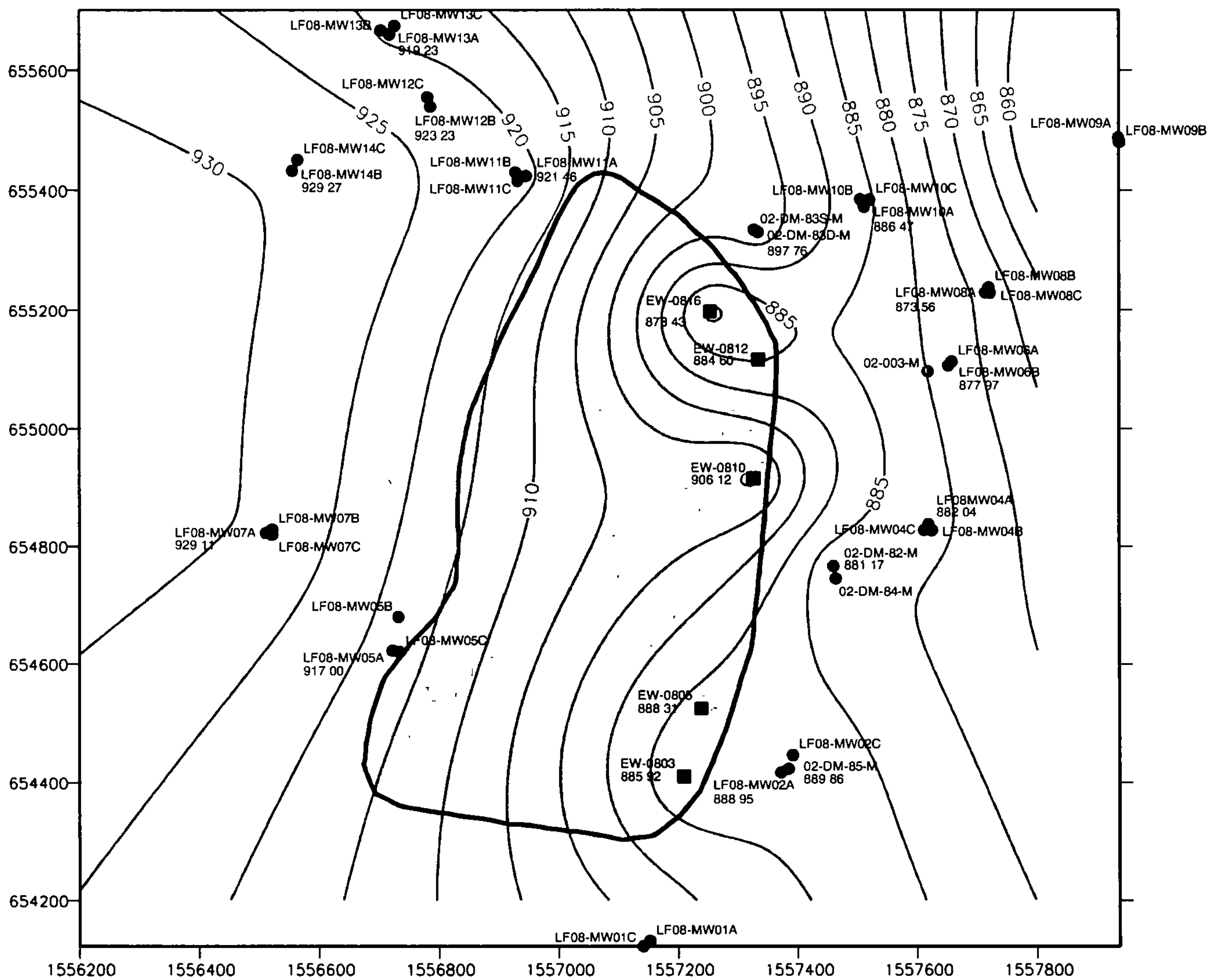

Figure 2-13

Landfill 8
Water Level Elevations
with Extraction Wells:
October 12, 1998

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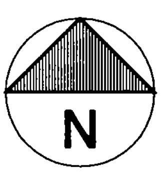
Wright-Patterson Air Force Base
Dayton, Ohio



INTERNATIONAL
TECHNOLOGY
CORPORATION

FILE 9843-36 DWG CLOSED 7/28/99 AT 2 04 PM

DRAWING NUMBER 9843-37 DWG | 7/28/99 | GP | CHECKED BY / APPROVED BY | MSN 6/22/99 | DRAWN BY

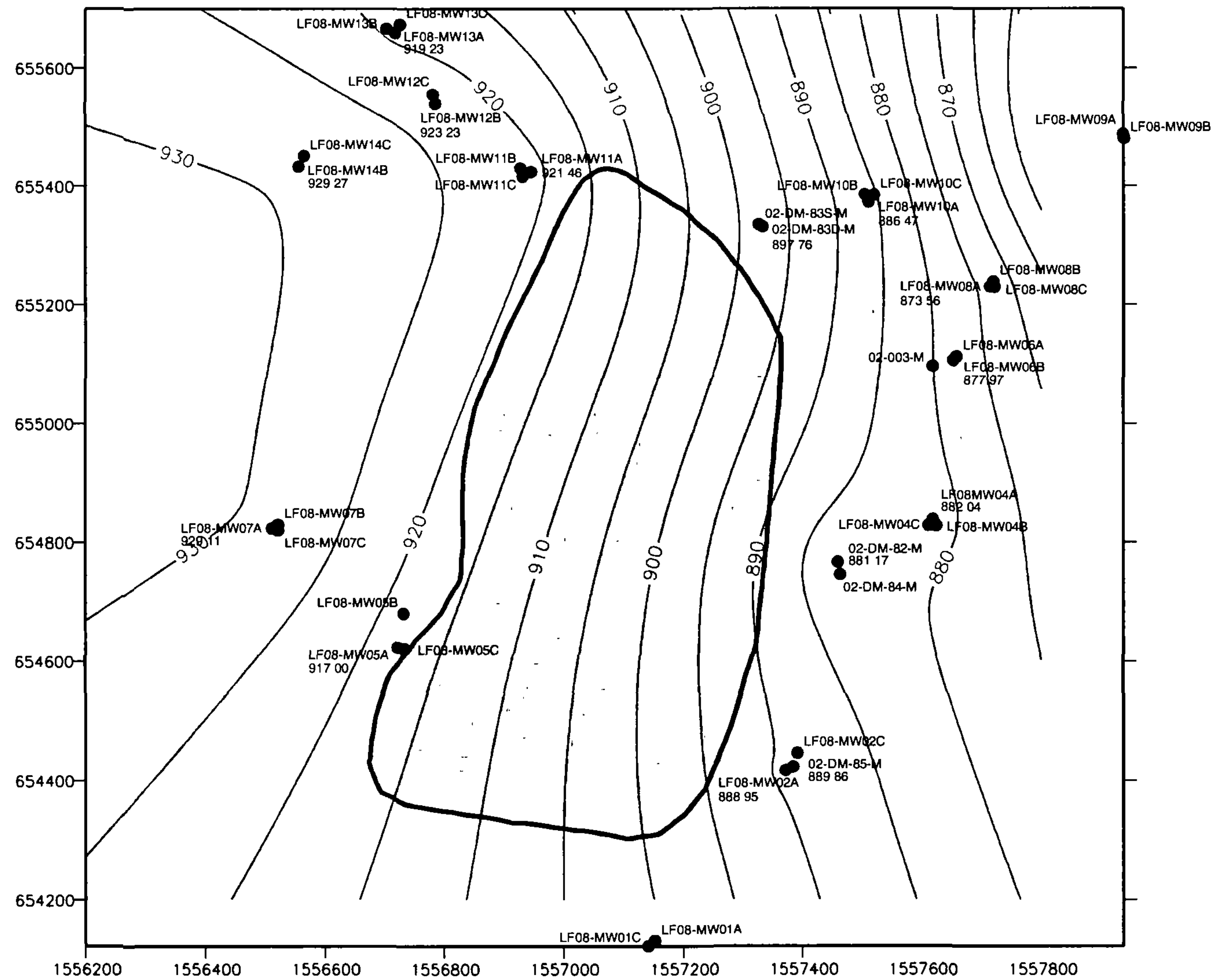


Figure 2-14

Landfill 8
Water Level Elevations
with No Extraction Wells:
October 12, 1998

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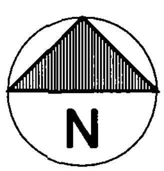

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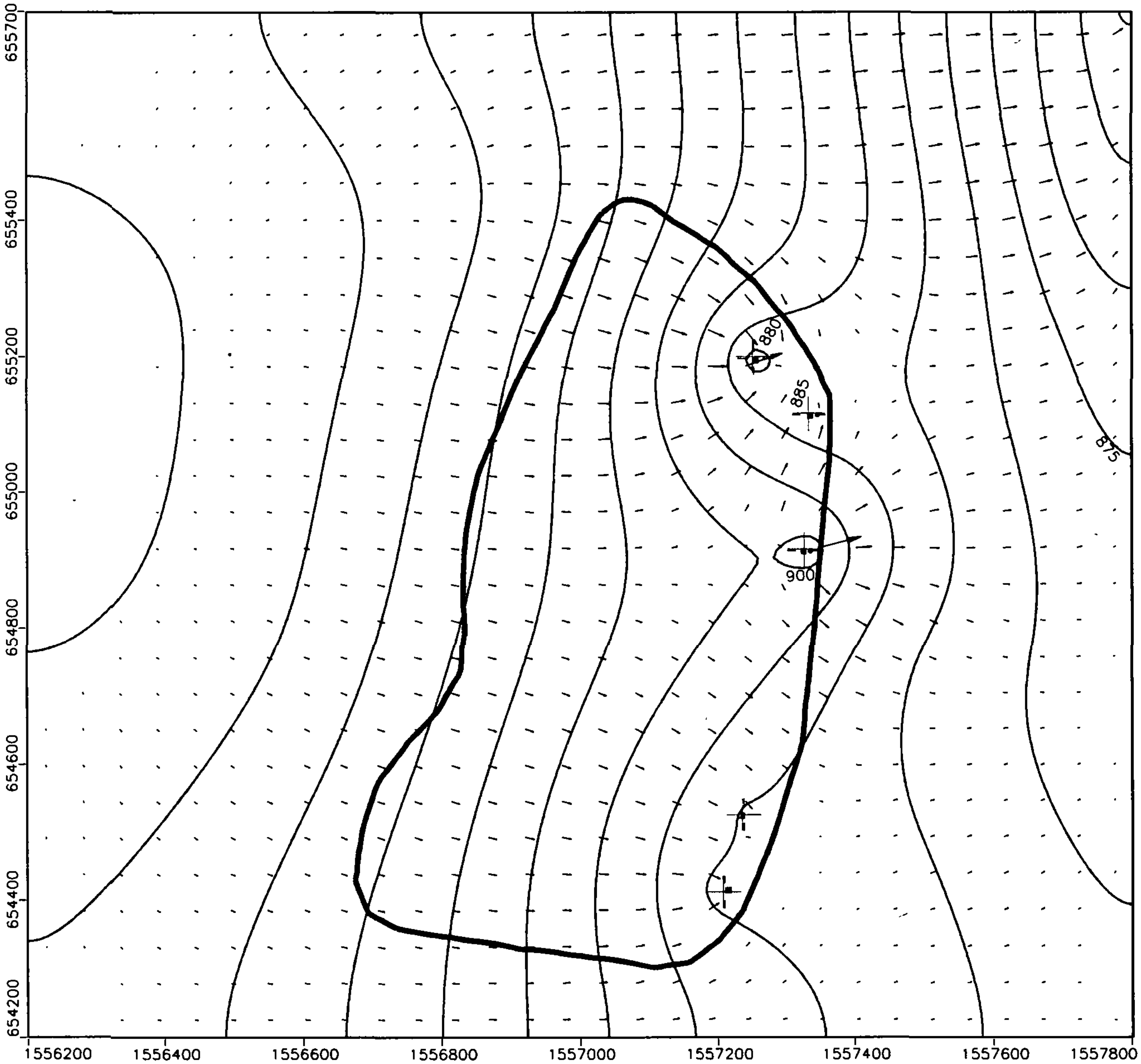

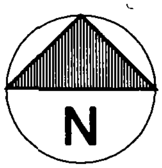

Figure 2-15

Landfill 8
Groundwater Velocity Vector Plot:
October 15, 1998

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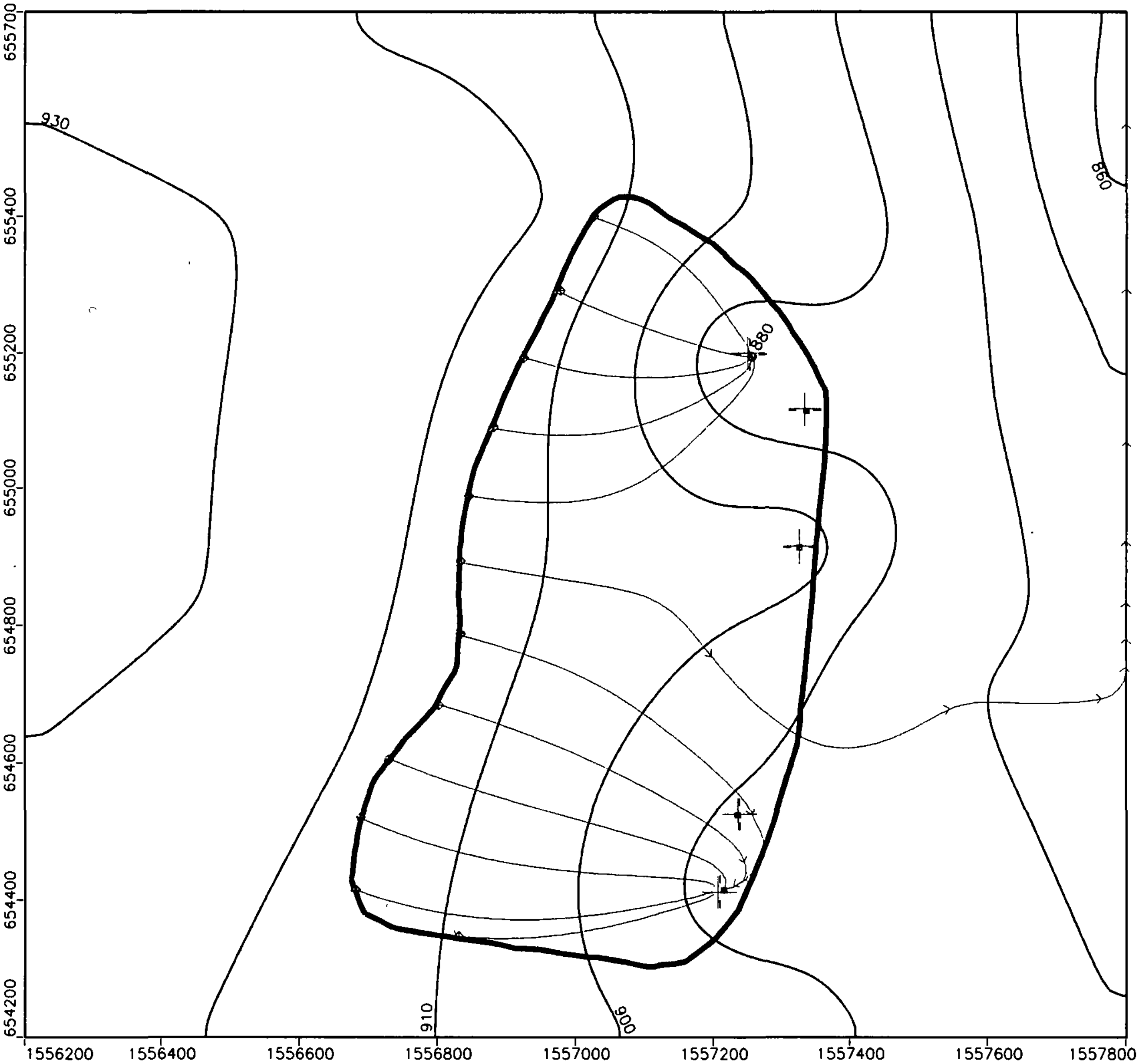

Figure 2-16

Landfill 8
Particle Tracking Plot:
October 15, 1998

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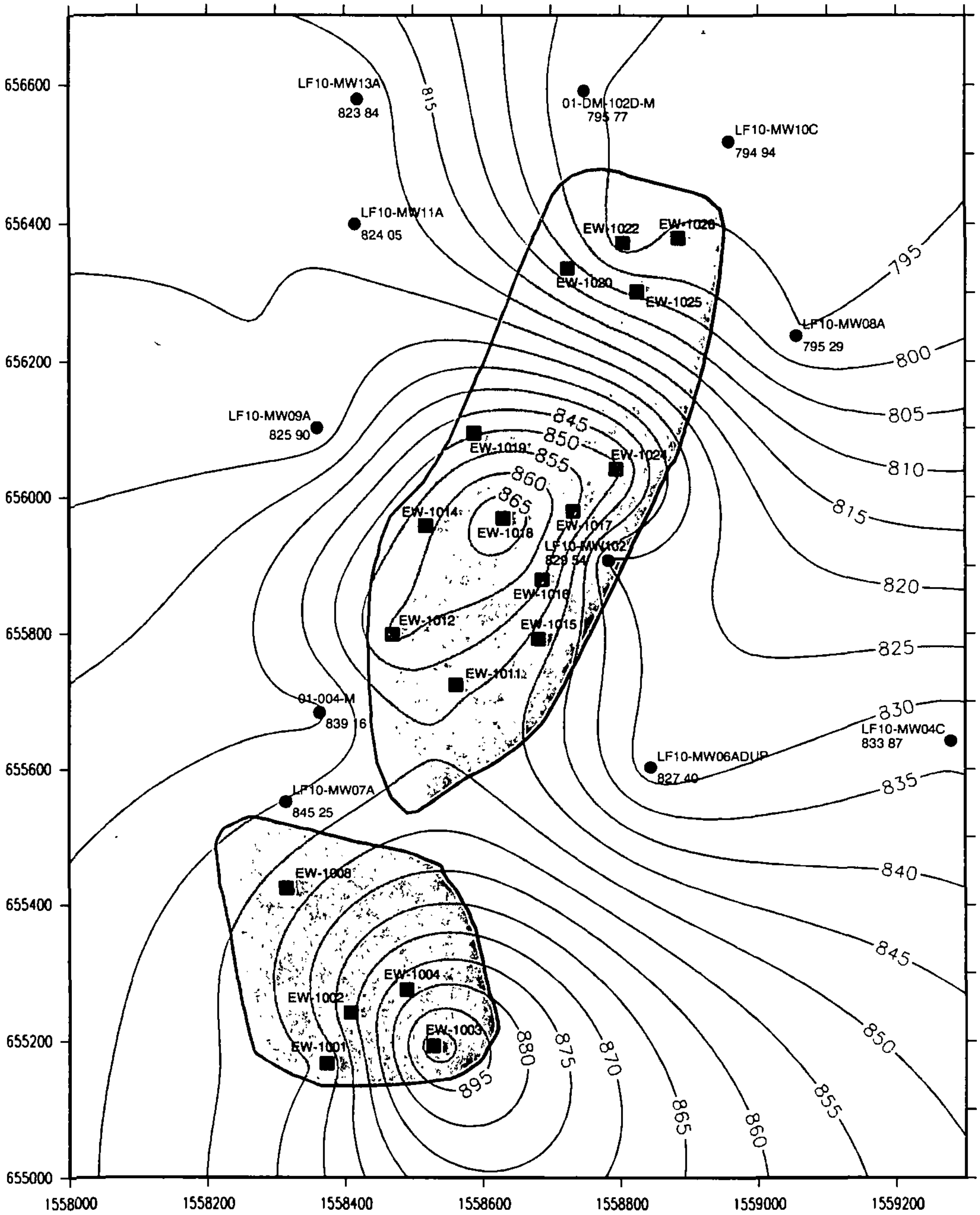

Figure 2-17

Landfill 10
Water Level Elevations
with Extraction Wells:
October 12, 1998

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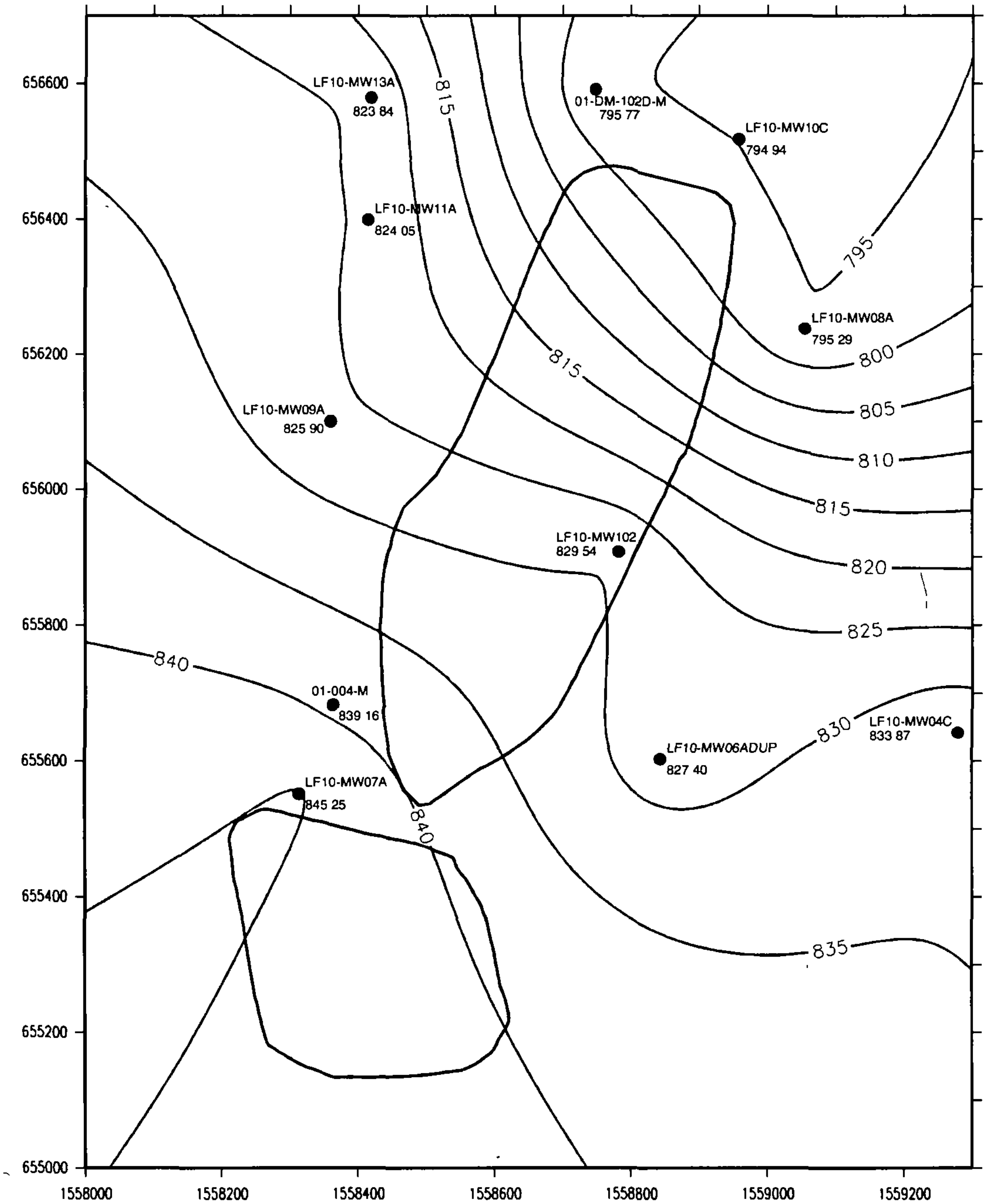

Figure 2-18

Landfill 10
Water Level Elevations
with No Extraction Wells:
October 12, 1998

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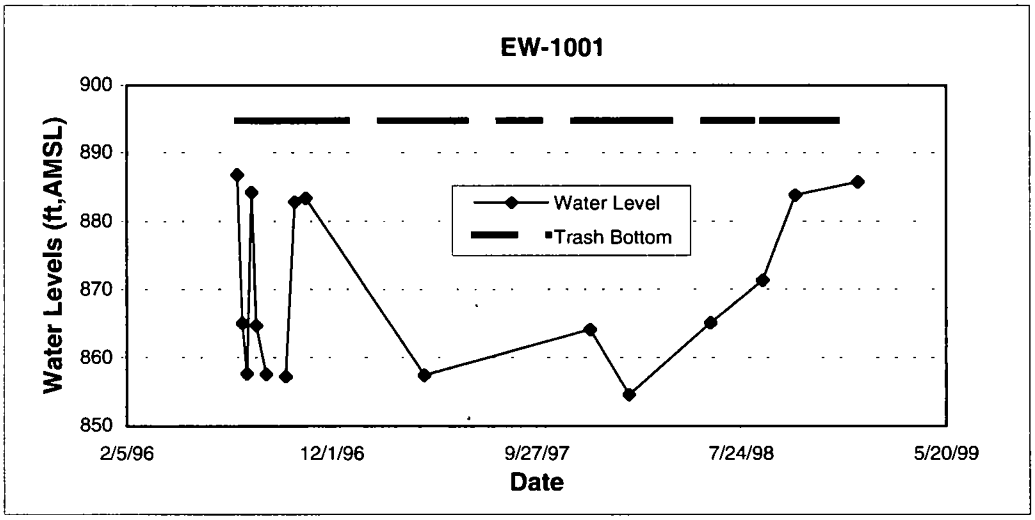
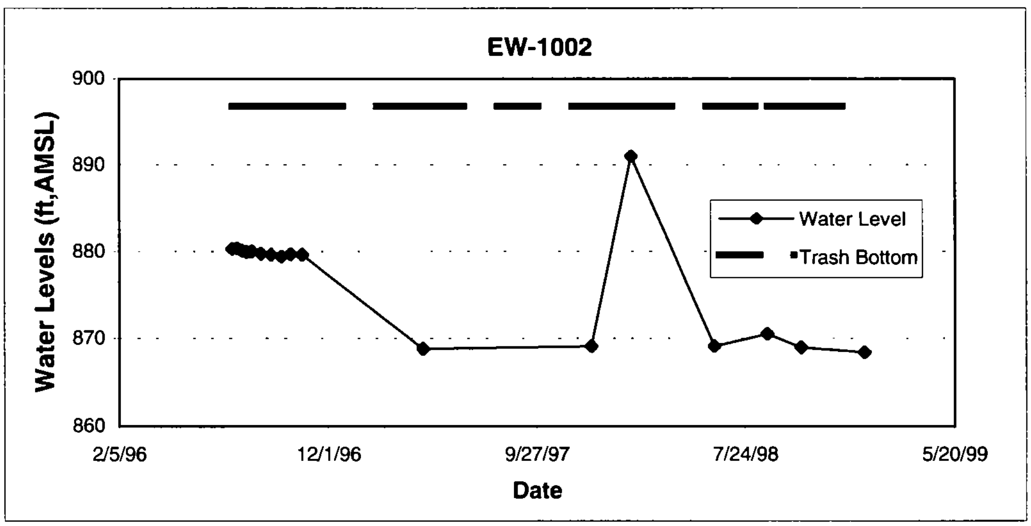
LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1001 and EW-1002
WPAFB - LTM Program

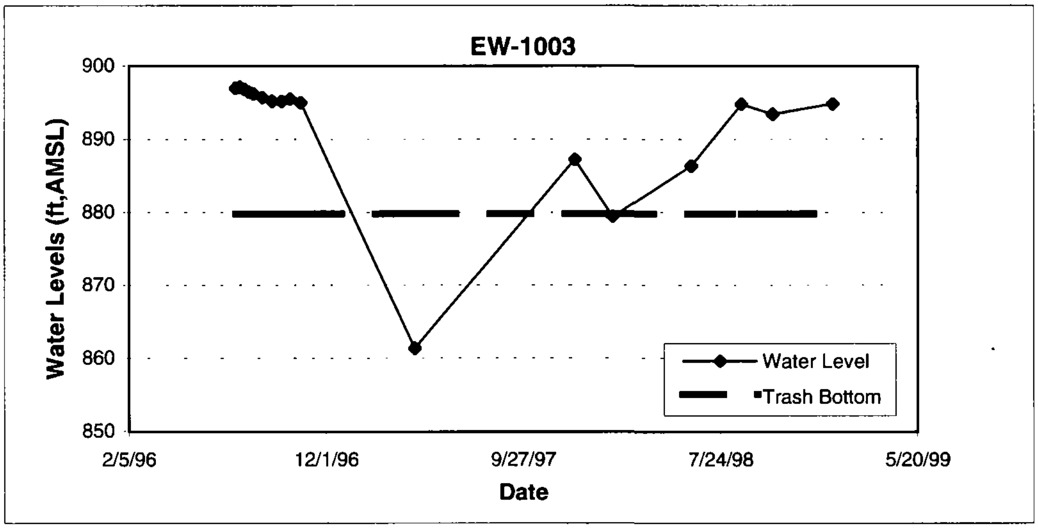




common3/Plamondo/Ltm/Figures/Oct98/O98lfgra xls/1001-2

FIGURE 2-19

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1003 and EW-1004
WPAFB - LTM Program



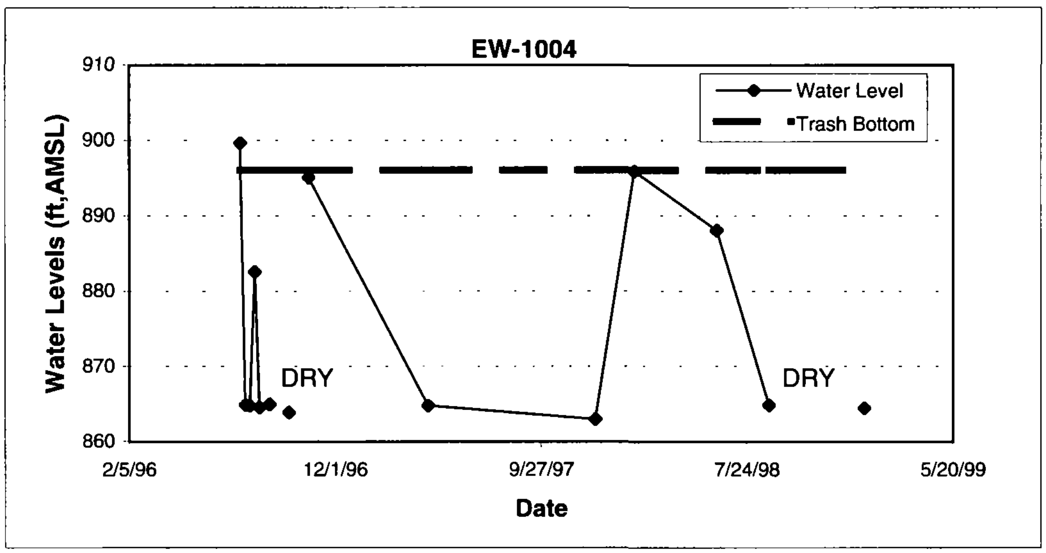
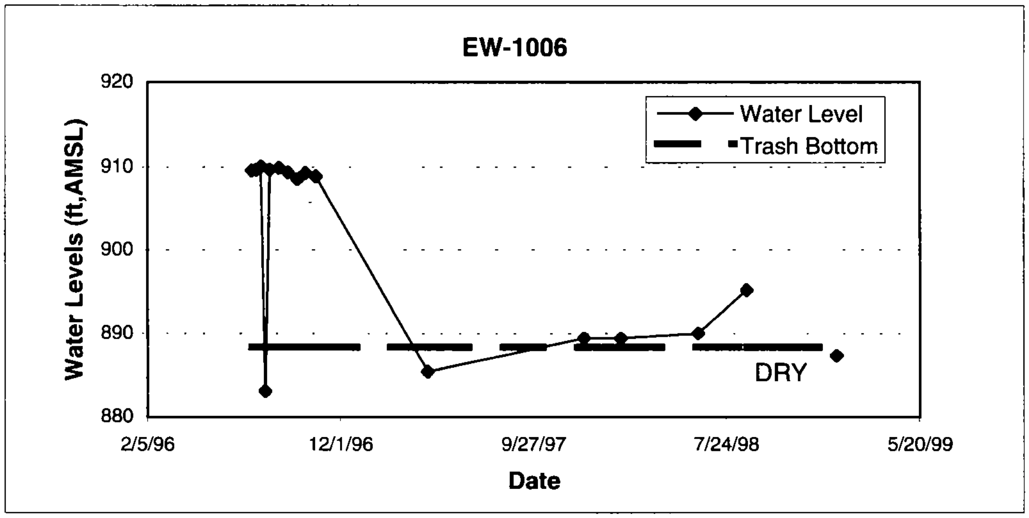


FIGURE 2-20

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1006 and EW-1008
WPAFB - LTM Program



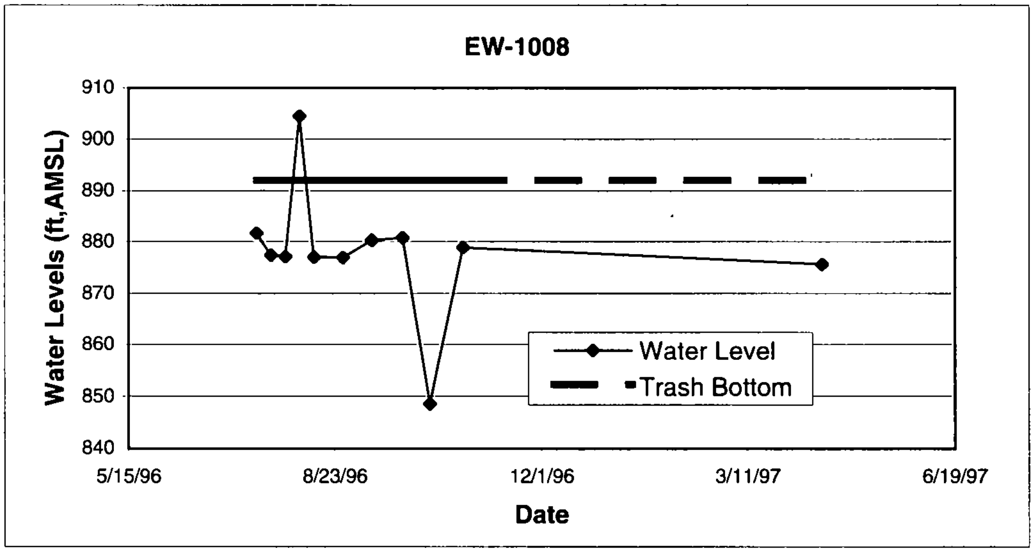


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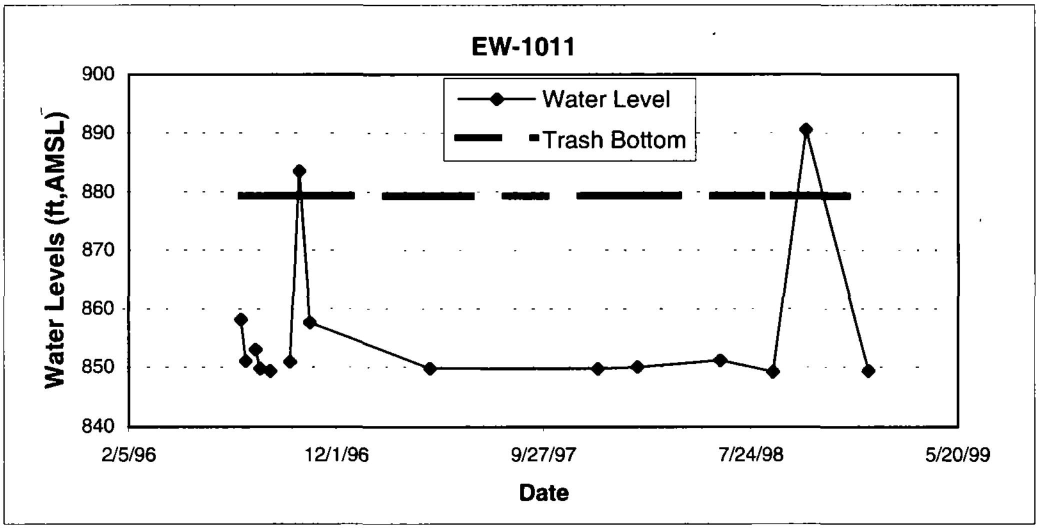
FIGURE 2-21

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1011 and EW-1012
WPAFB - LTM Program



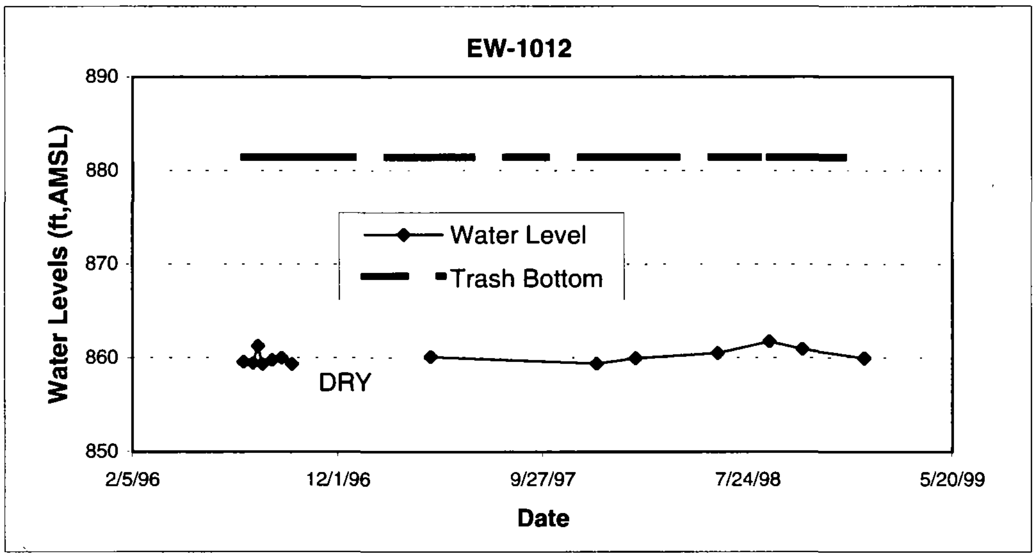


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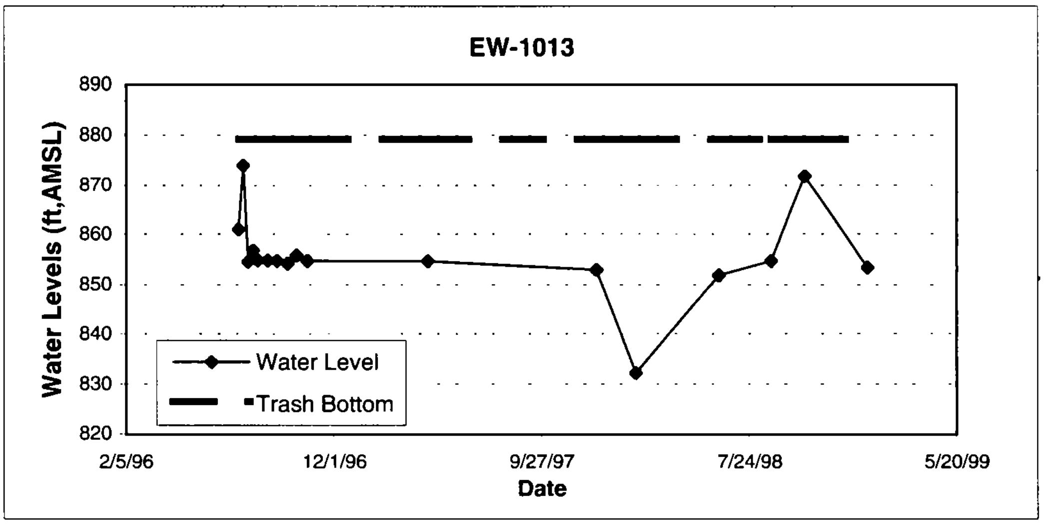
FIGURE 2-22

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1013 and EW-1014
WPAFB - LTM Program



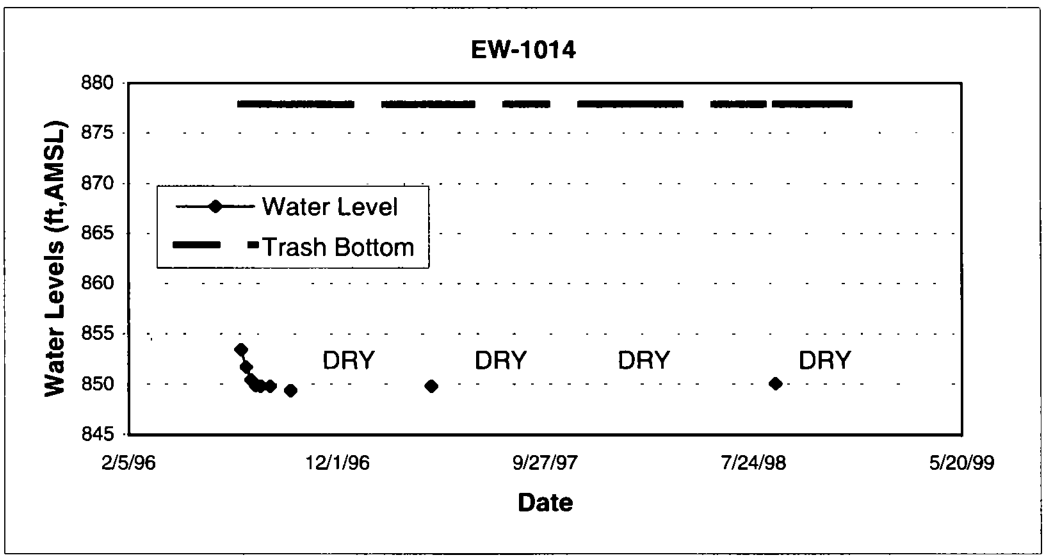


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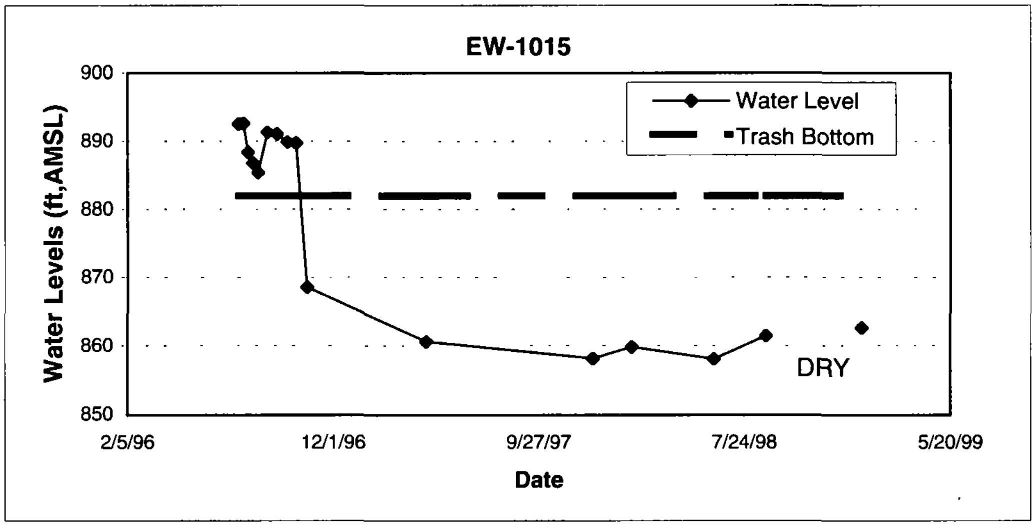
FIGURE 2-23

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1015 and EW-1016
WPAFB - LTM Program



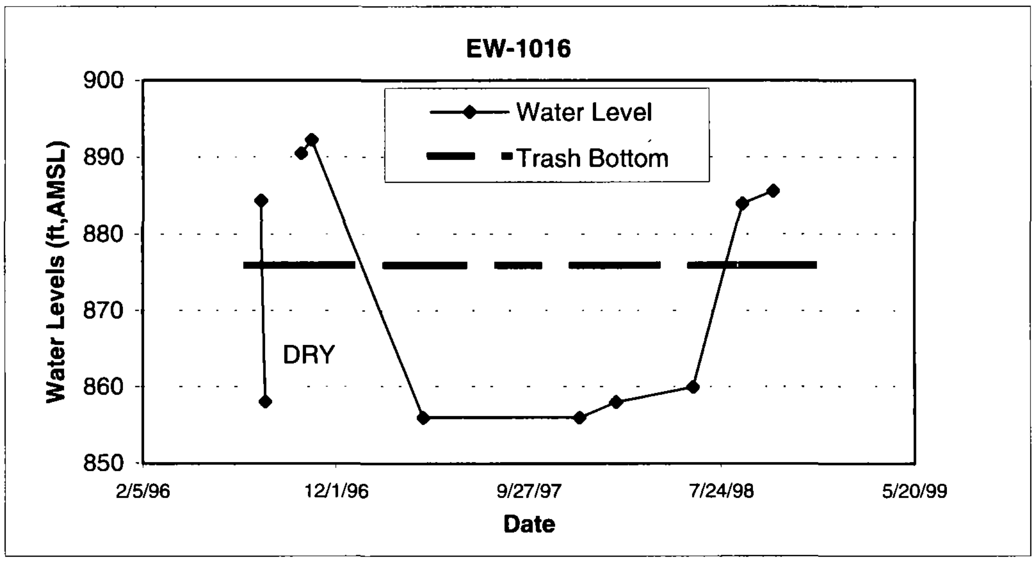


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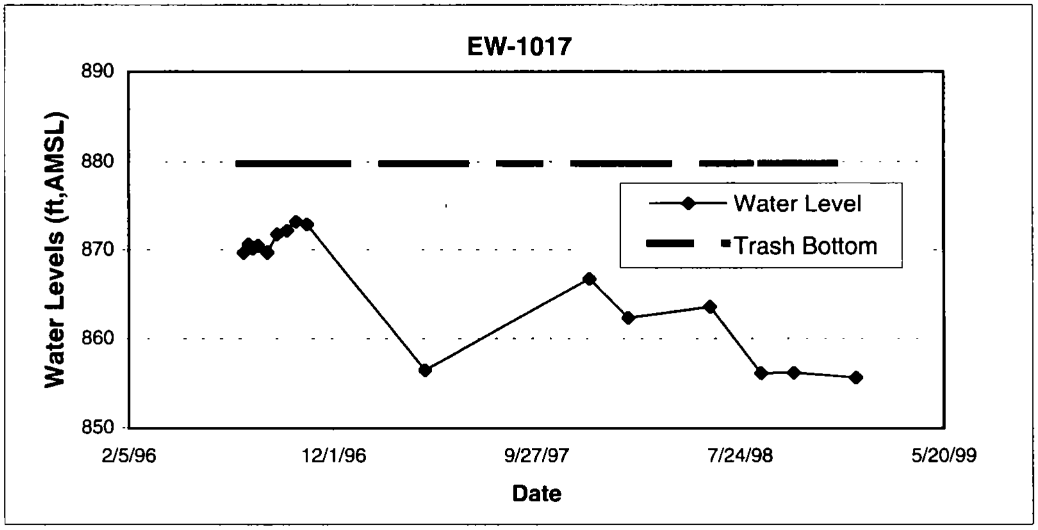
FIGURE 2-24

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1017 and EW-1018
WPAFB - LTM Program



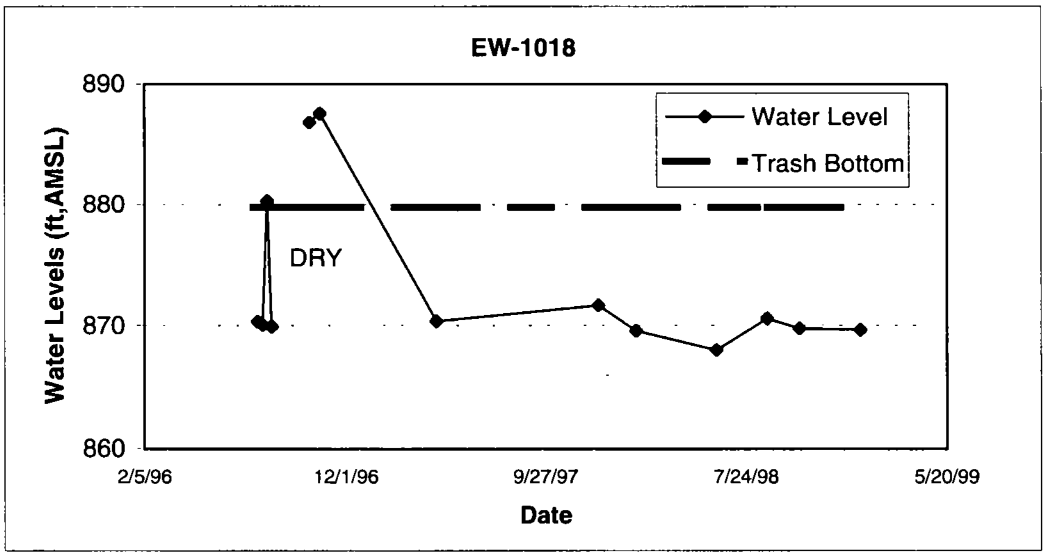


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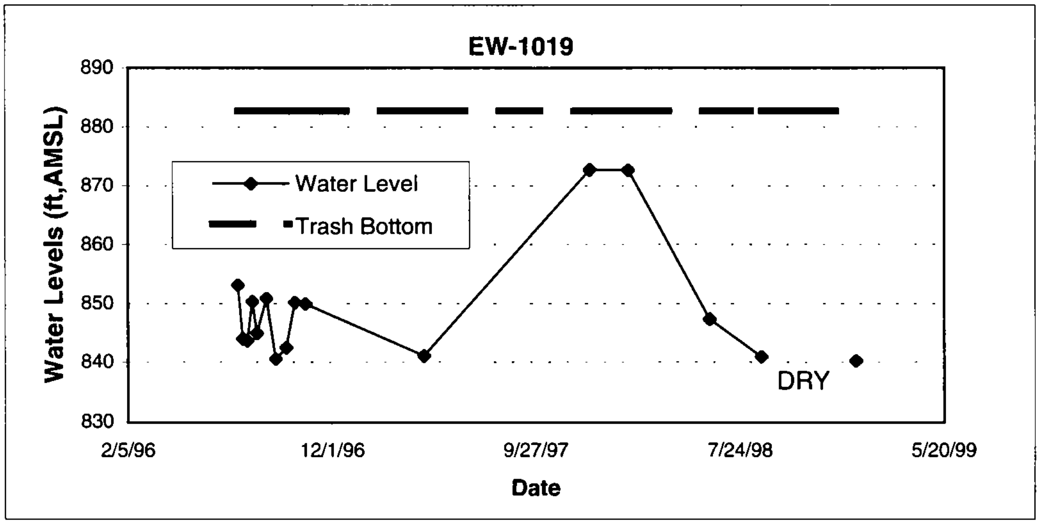
FIGURE 2-25

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1019 and EW-1020
WPAFB - LTM Program



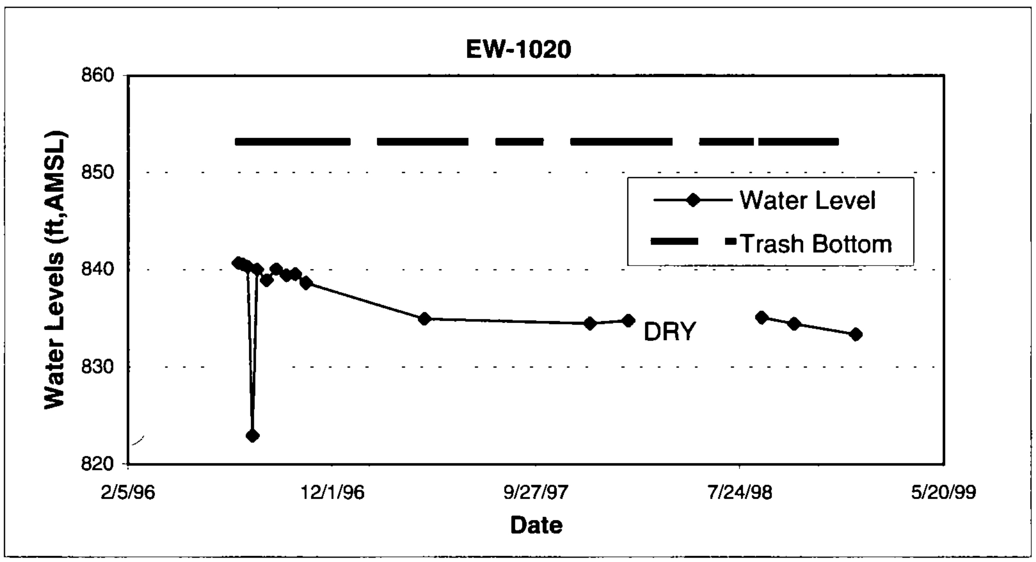


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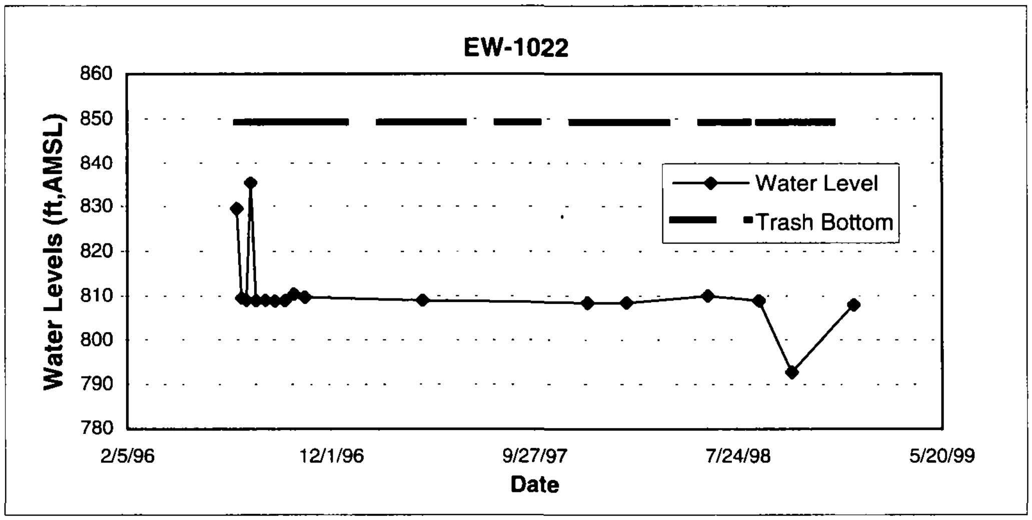
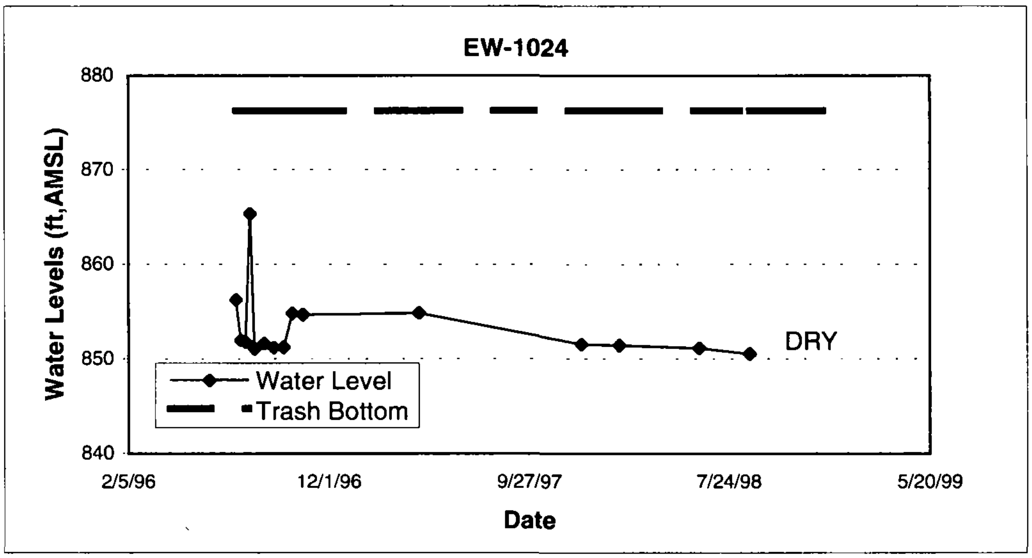
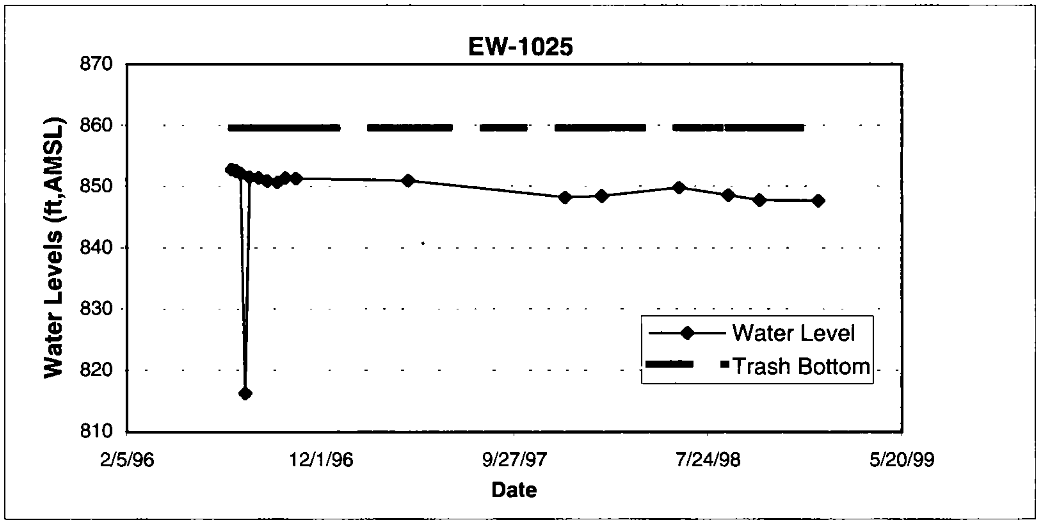
FIGURE 2-26

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1022 and EW-1024
WPAFB - LTM Program





LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1025 and EW-1026
WPAFB - LTM Program



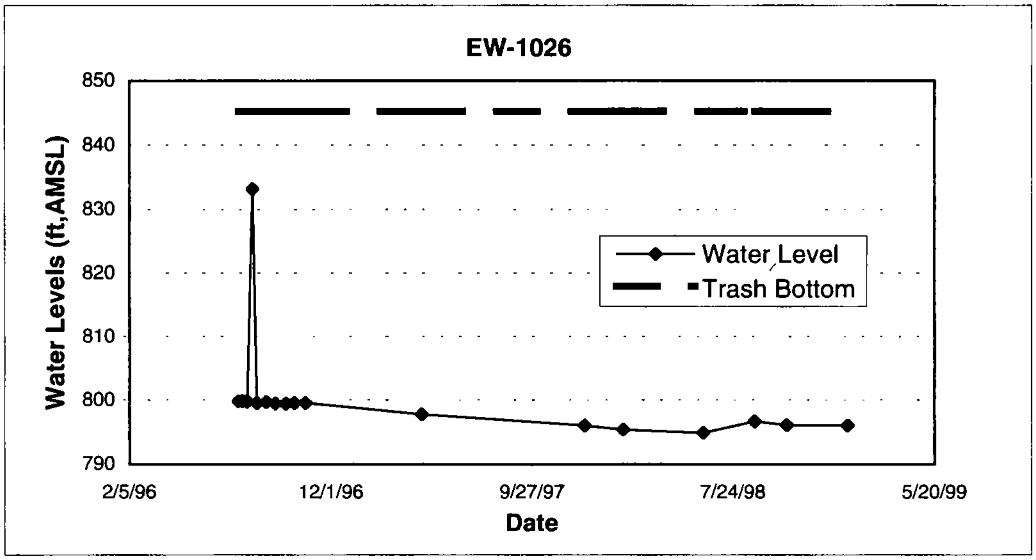


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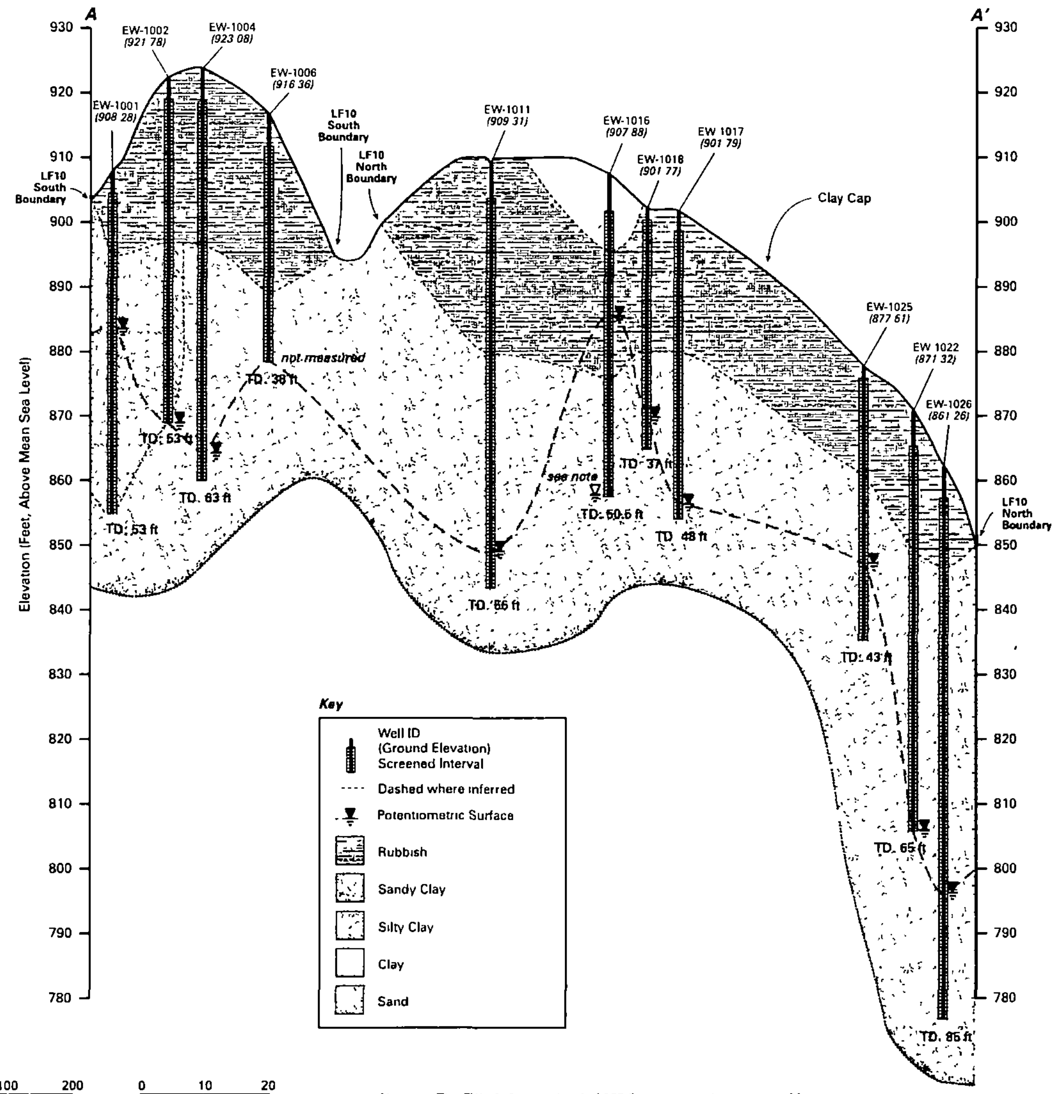
FIGURE 2-28



Horizontal Scale, Feet (0, 100, 200)

Vertical Scale, Feet (0, 10, 20)

Note: The EW-1016 water level of 857 5 represents the average of four consecutive meaurements from April and December 1997, February and June 1998 which was 857 5

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Figure 2-29
Landfill 10 Geologic Cross-Section and Potentiometric Surface October 1998

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JJS III 3/31/99

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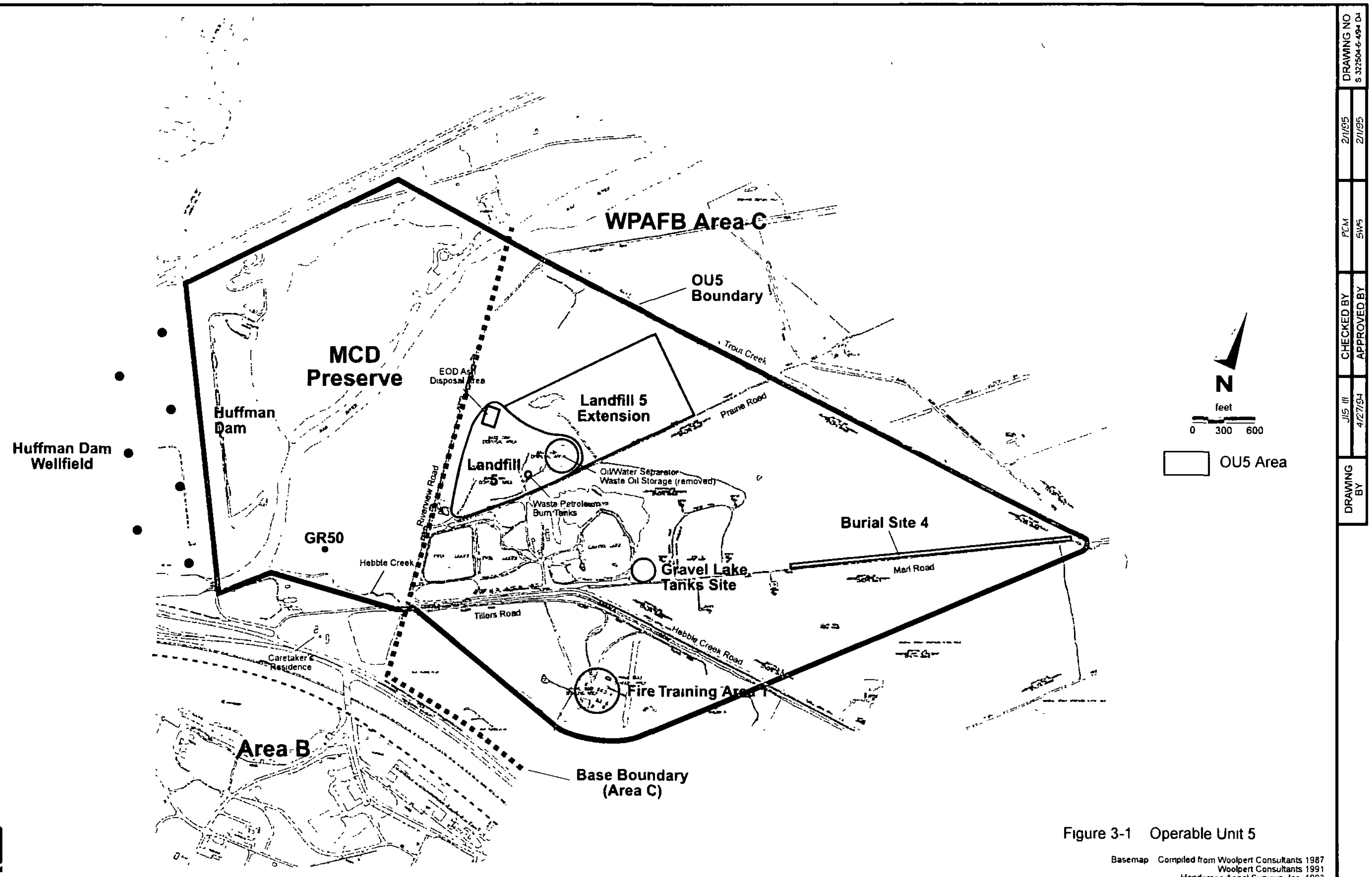

Figure 3-1 Operable Unit 5

Basemap Compiled from Woolpert Consultants 1987
Woolpert Consultants 1991
Henderson Aerial Surveys Inc 1993

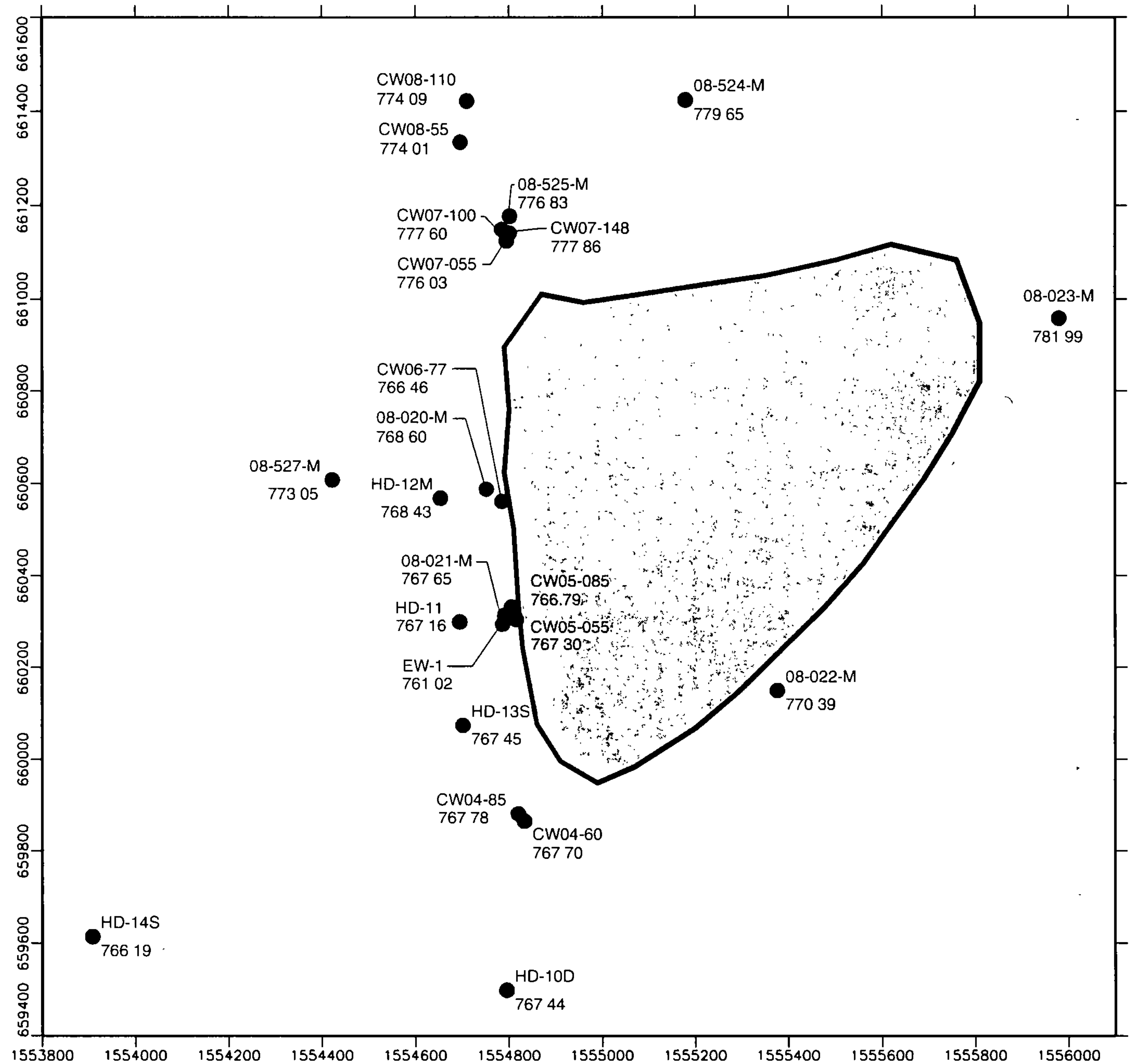

Figure 3-2

OU5
Water Level Elevations:
December 9, 1998

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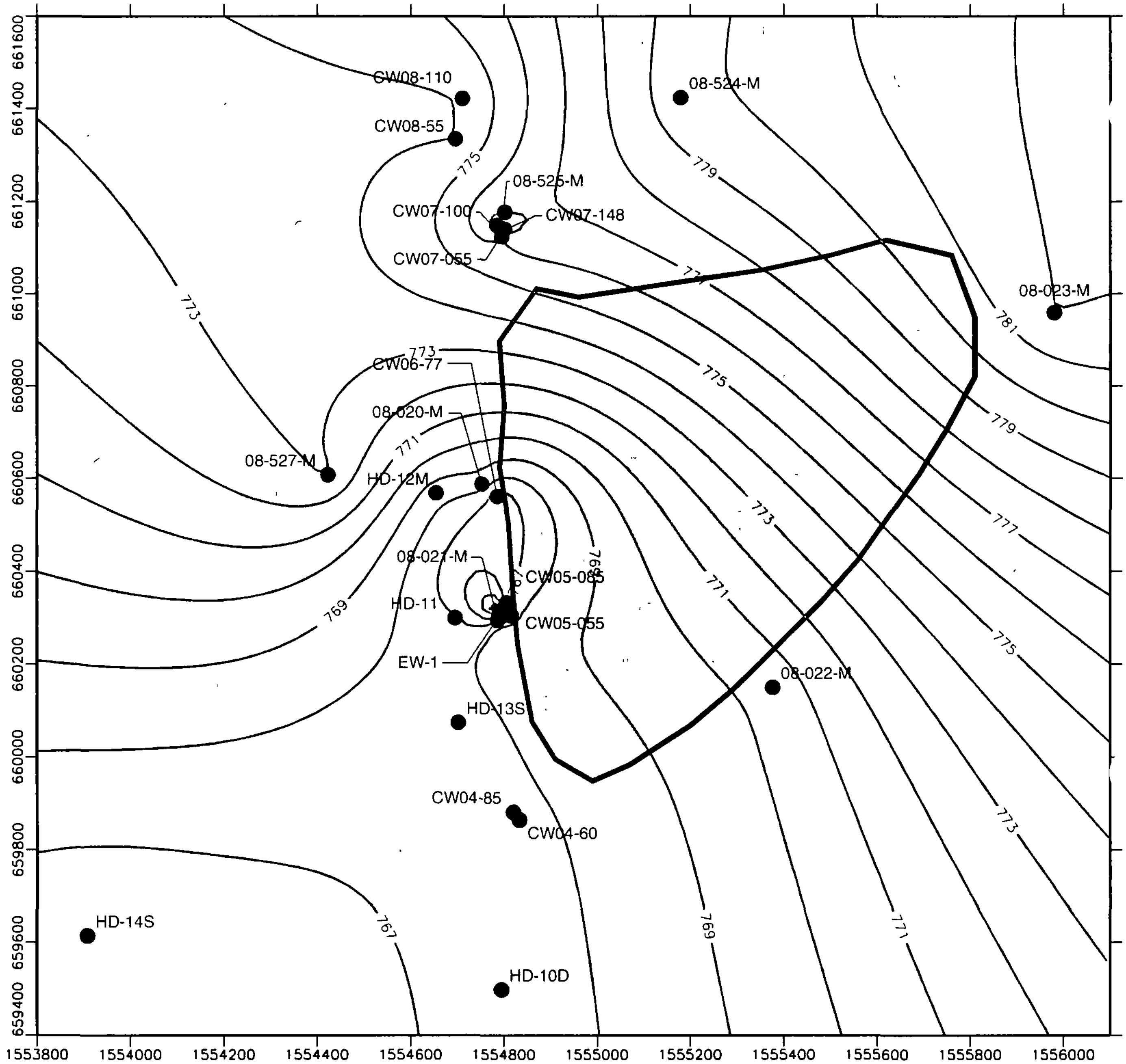

Figure 3-3

OU5
Groundwater Level
Elevation Contour Plot:
December 9, 1998

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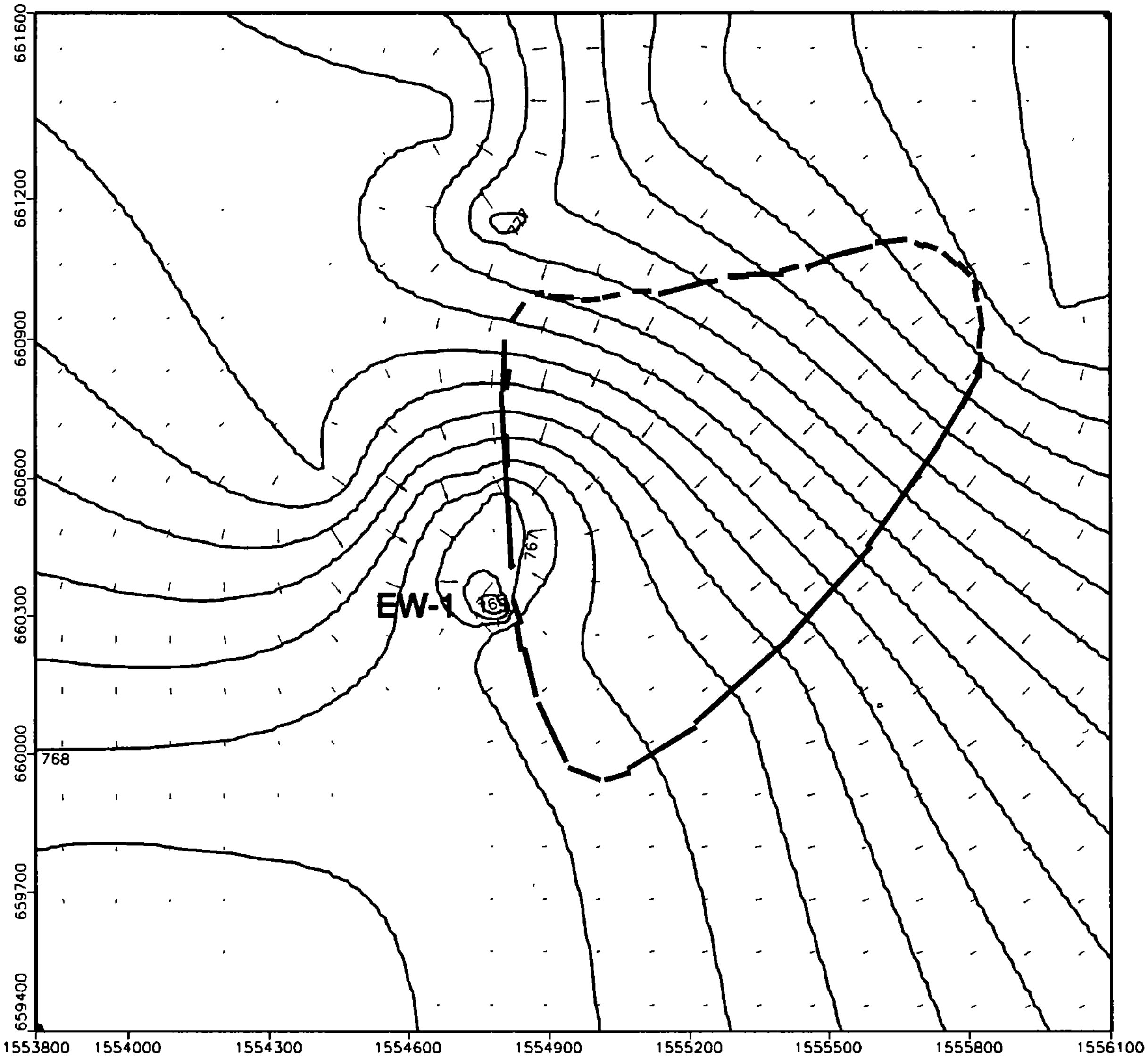

Figure 3-4

OU 5
Groundwater Velocity Vector Plot:
December 9, 1998

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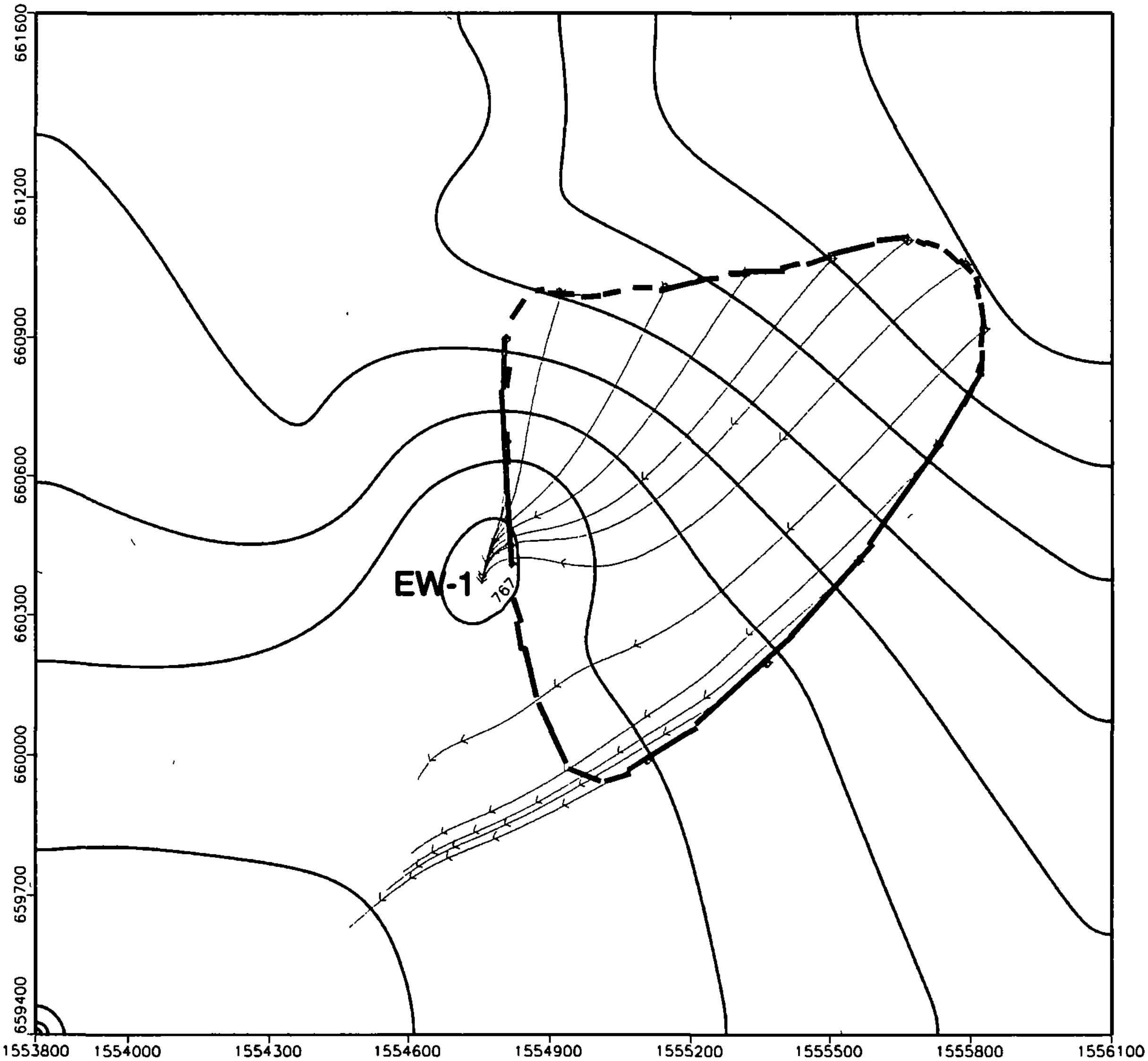

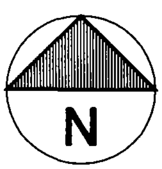

Figure 3-5

OU 5
Particle Tracking Plot:
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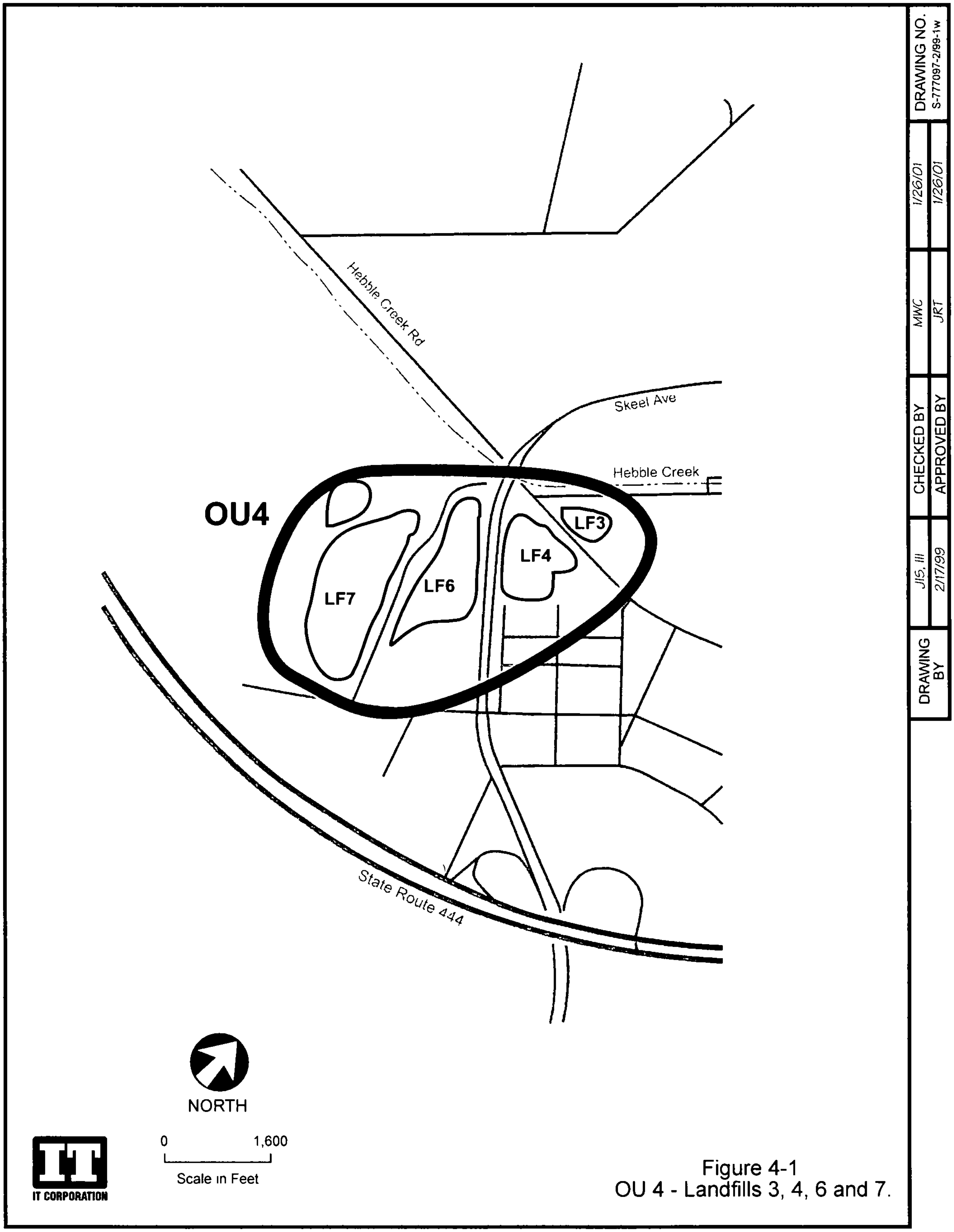

Figure 4-1
OU 4 - Landfills 3, 4, 6 and 7.

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	2/11/99
	GP
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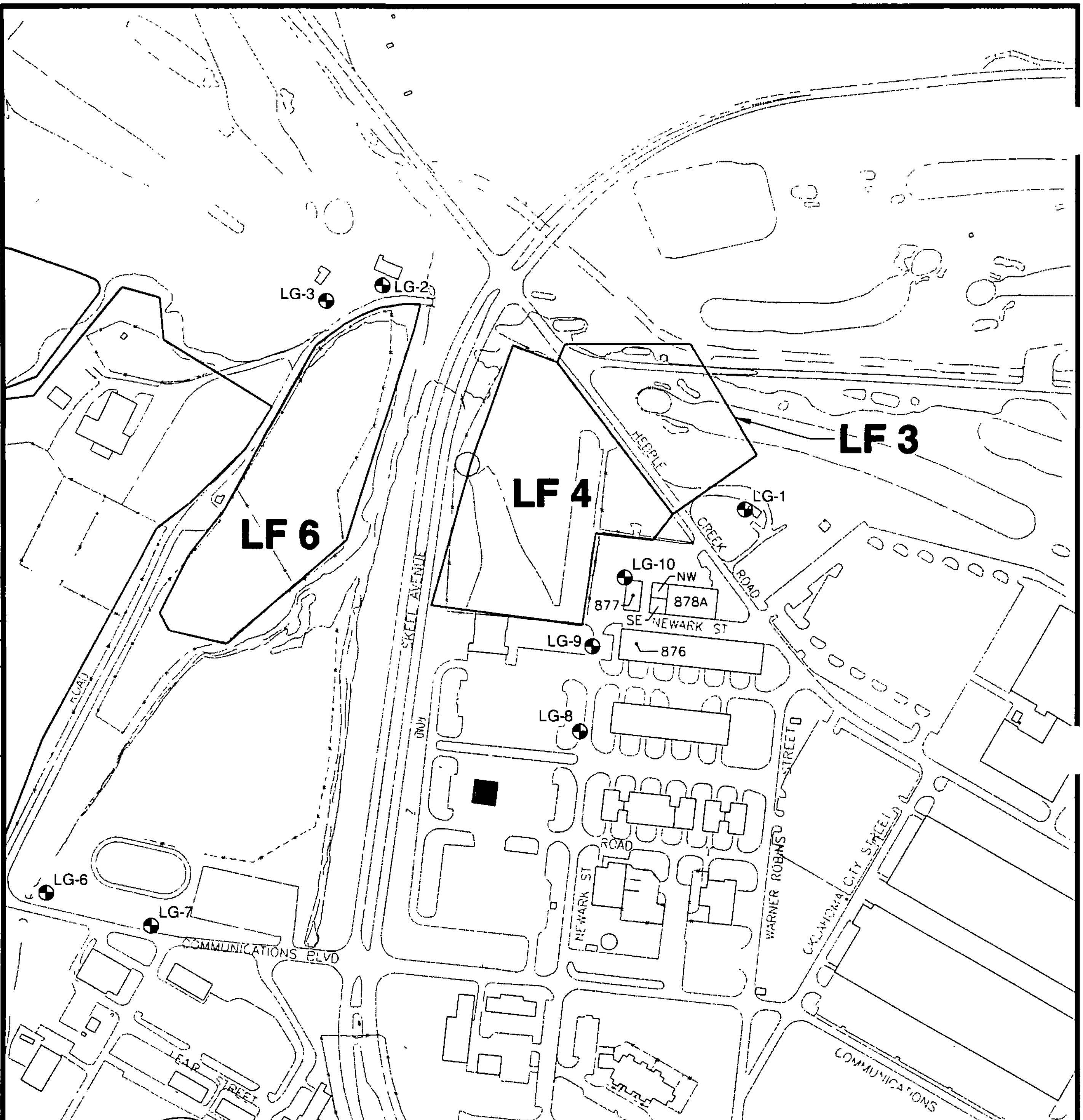

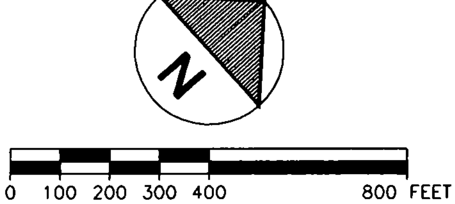

Figure 4-2
LANDFILL GAS
MONITORING WELLS: OU4

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LEGEND

LG-1 LANDFILL GAS MONITORING WELL LOCATIONS

IRP SITES (LOCATIONS APPROXIMATE)

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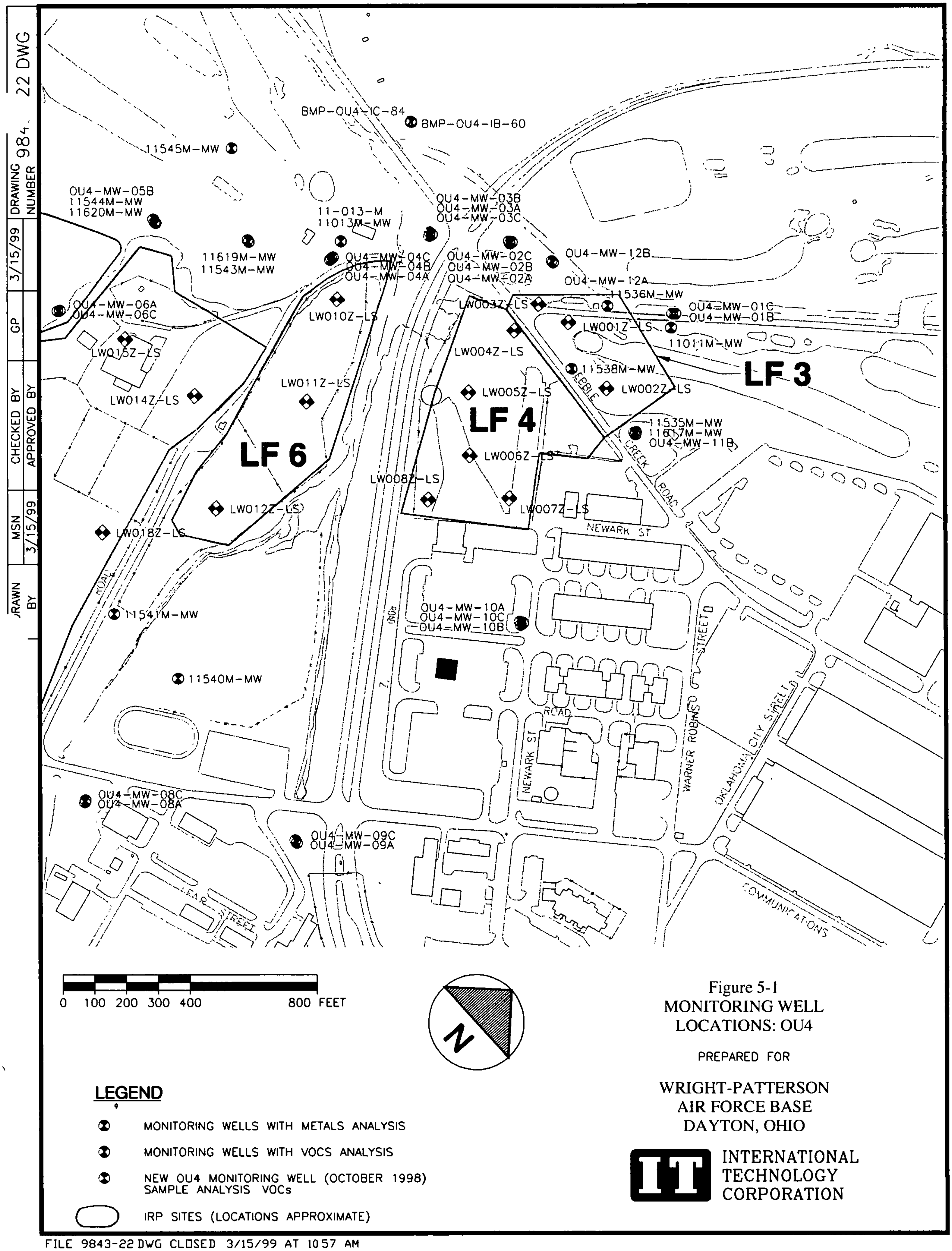
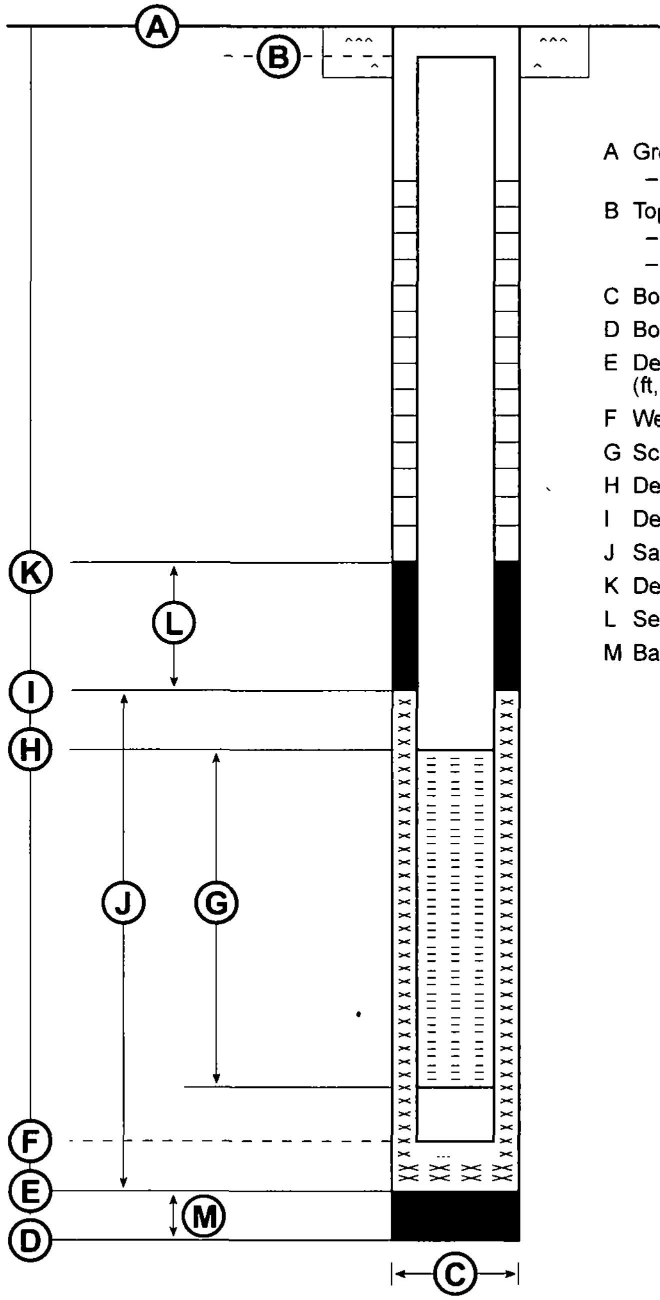


Figure 5-1
MONITORING WELL
LOCATIONS: OU4



A Ground surface (GS)
– elevation (ft, MSL)

B Top of casing
– elevation (ft, MSL)
– height (ft, BGS)

C Borehole diameter (ft)

D Borehole depth (ft, BGS)

E Depth to bottom of sand pack (ft, BGS)

F Well depth (ft, BGS)

G Screen length (ft)

H Depth to screen (ft, BGS)

I Depth to sand pack (ft, BGS)

J Sand pack thickness (ft)

K Depth to seal (ft, BGS)

L Seal thickness (ft)

M Backfill thickness (ft)

Figure 5-2. Typical Flush-Mounted Well Construction Diagram.

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CHECKED BY JJS, III

APPROVED BY 6/2/94

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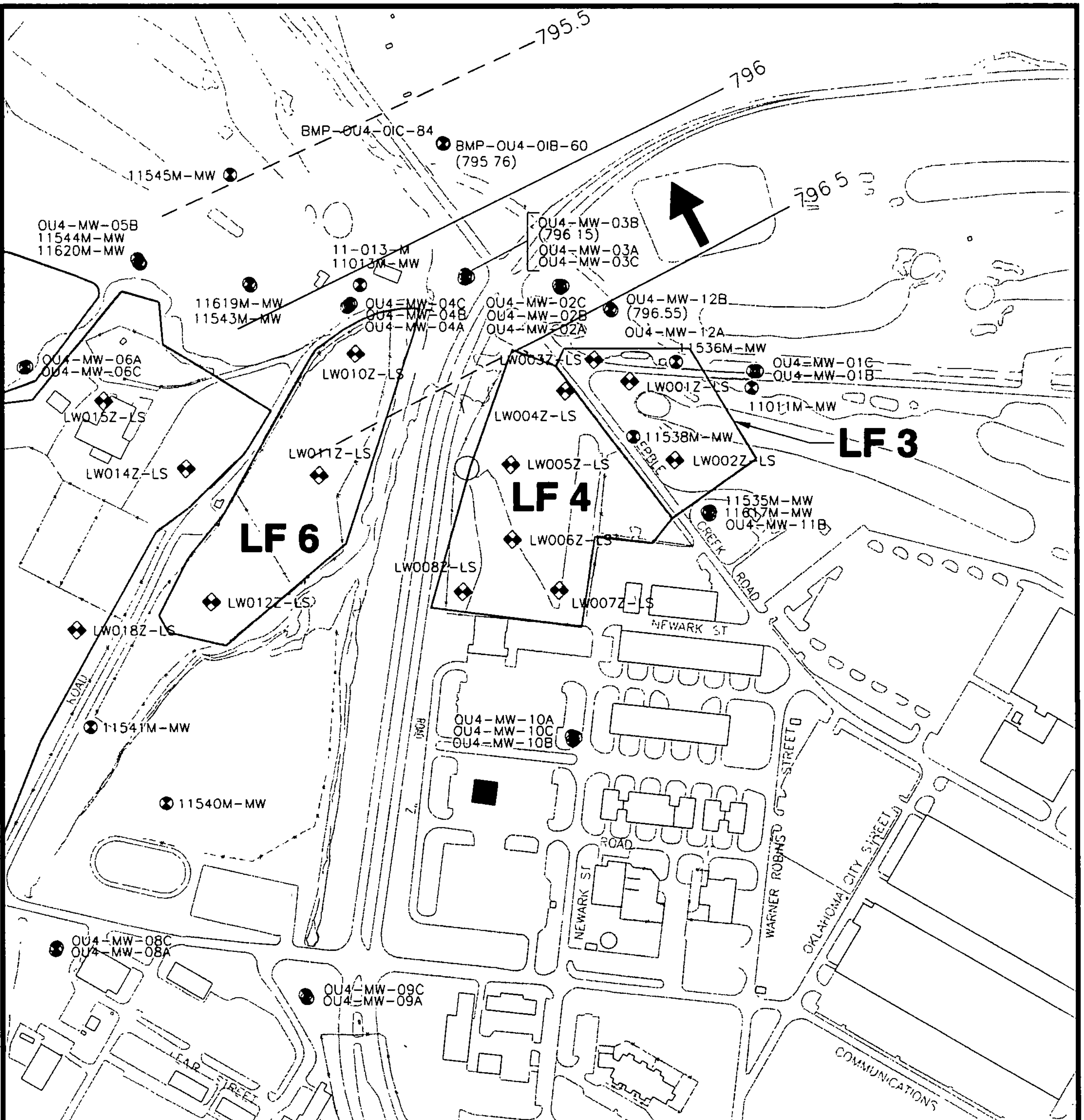

0 100 200 300 400 800 FEET

N

LEGEND

- MONITORING WELLS WITH METALS ANALYSIS
- MONITORING WELLS WITH VOCS ANALYSIS
- GROUNDWATER ELEVATION CONTOUR (ft, msl), DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION
- IRP SITES (LOCATIONS APPROXIMATE)

Figure 5-3
GROUNDWATER ELEVATION CONTOUR MAP FOR THE "B" AQUIFER ZONE WELLS

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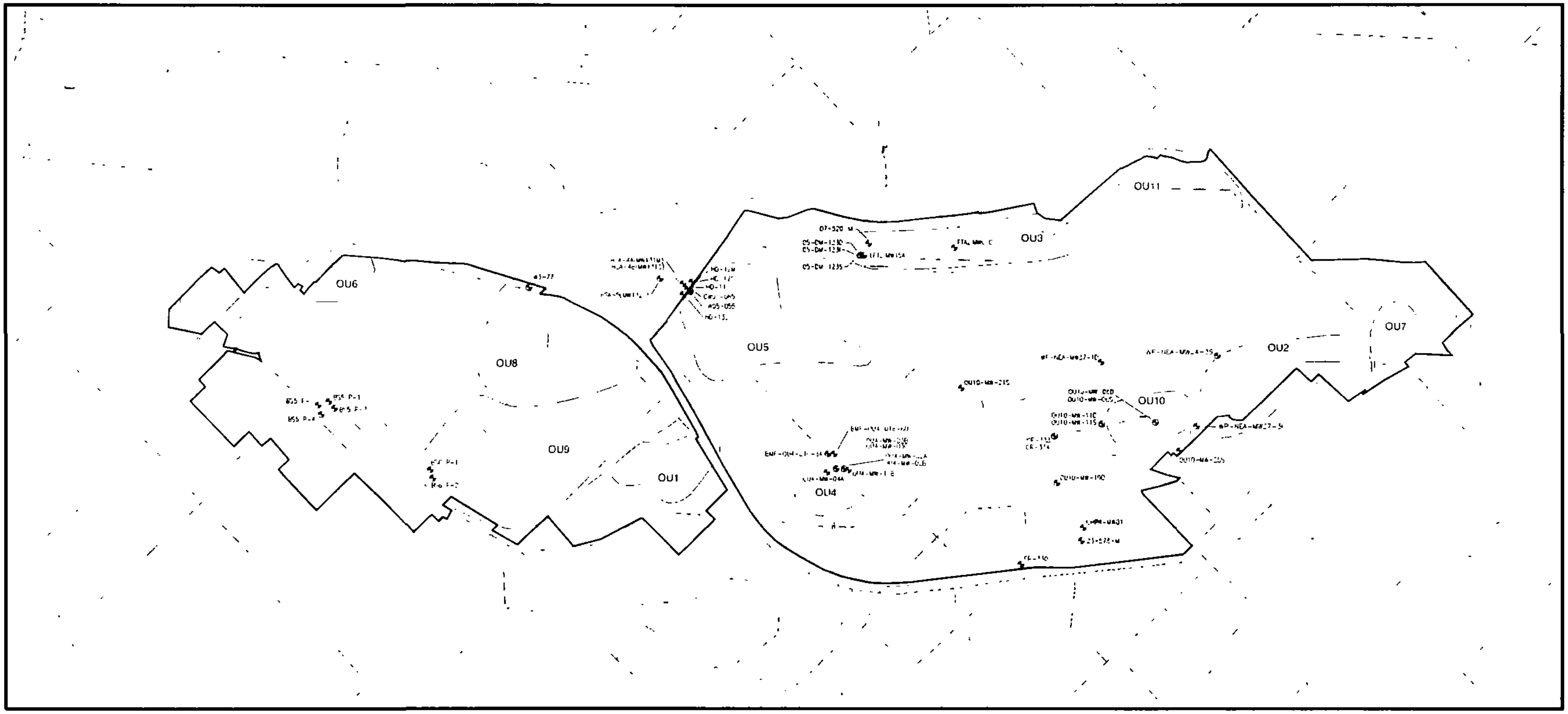

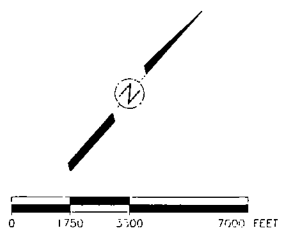

LEGEND:

- Monitoring Well Locations
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries

Figure 6-1
Semiannual Basewide Long-Term Monitoring Well Locations

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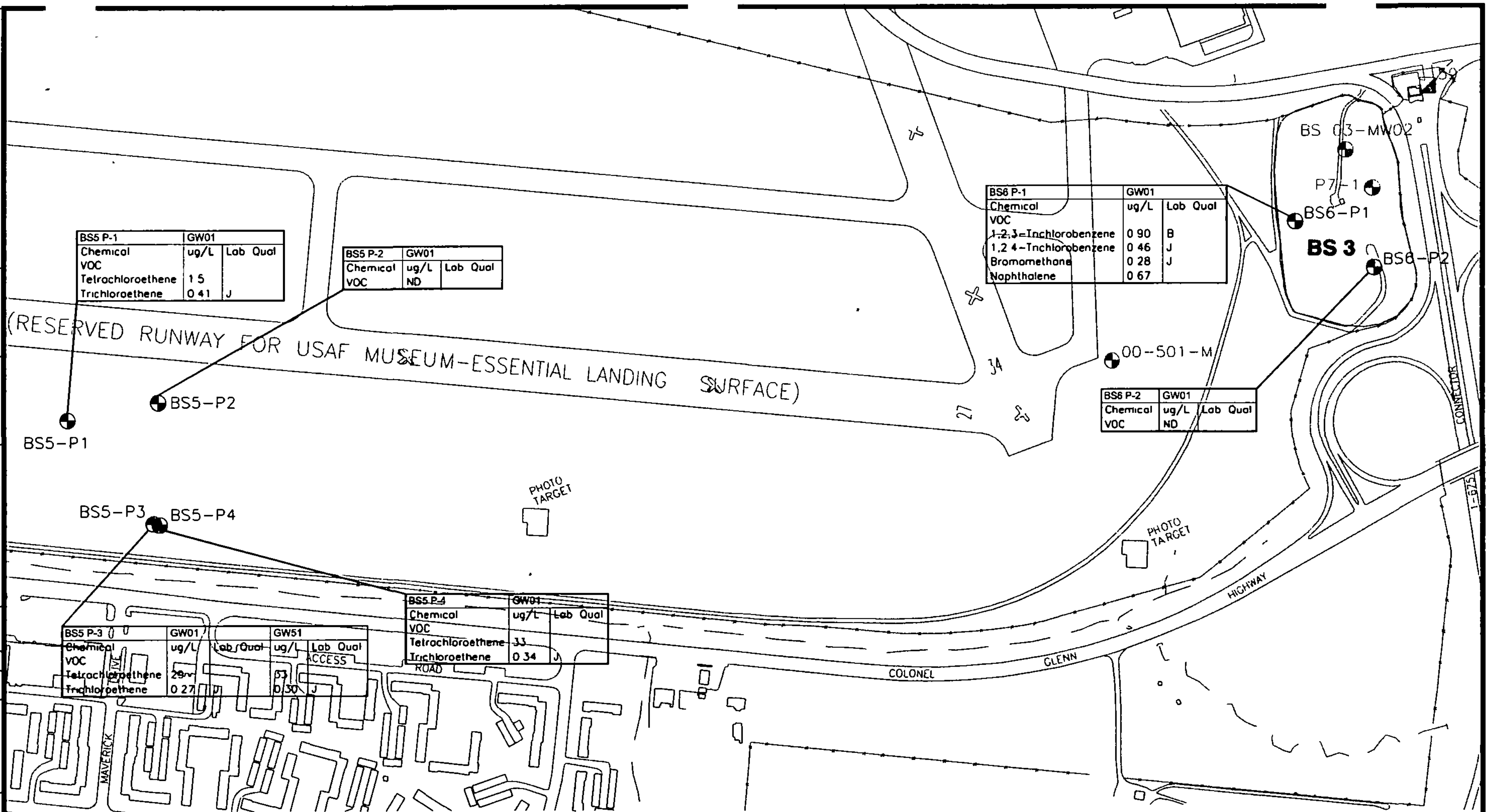

BS5 P-1	GW01	
Chemical	ug/L	Lab Qual
VOC		
Tetrachloroethene	1 5	
Trichloroethene	0 41	J

BS5 P-2	GW01	
Chemical	ug/L	Lab Qual
VOC	ND	

BS5 P-3	GW01		GW51	
Chemical	ug/L	Lab Qual	ug/L	Lab Qual
VOC				
Tetrachloroethene	29		33	
Trichloroethene	0 27	J	0 30	J

BS5 P-4	GW01	
Chemical	ug/L	Lab Qual
VOC		
Tetrachloroethene	33	
Trichloroethene	0 34	J

BS6 P-1	GW01	
Chemical	ug/L	Lab Qual
VOC		
1,2,3-Trichlorobenzene	0 90	B
1,2 4-Trichlorobenzene	0 46	J
Bromomethane	0 28	J
Naphthalene	0 67	

BS6 P-2	GW01	
Chemical	ug/L	Lab Qual
VOC	ND	

LEGEND:

MONITORING WELL LOCATION

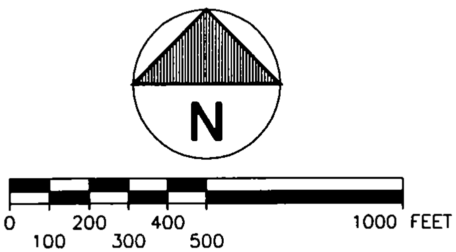

Figure 6-2
Burial Site 5 and 6
Detected Chemicals of Concern:
October 1998

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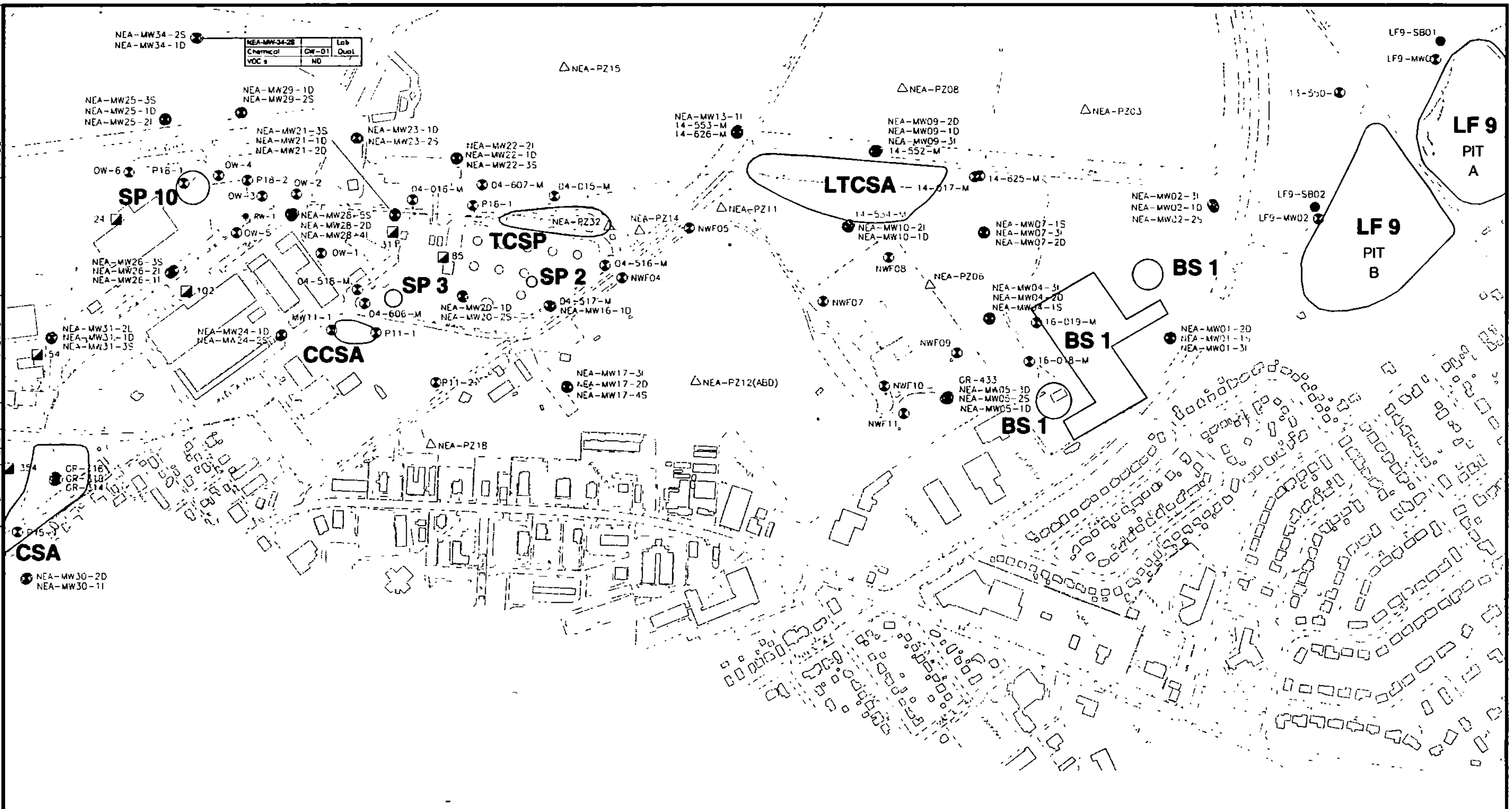

LEGEND

MONITORING WELL LOCATION

IRP SITES (LOCATIONS APPROXIMATE)

0 100 200 300 400 500 1000 FEET

N

Figure 6-3
OU2 Detected Chemicals of Concern: October 1998

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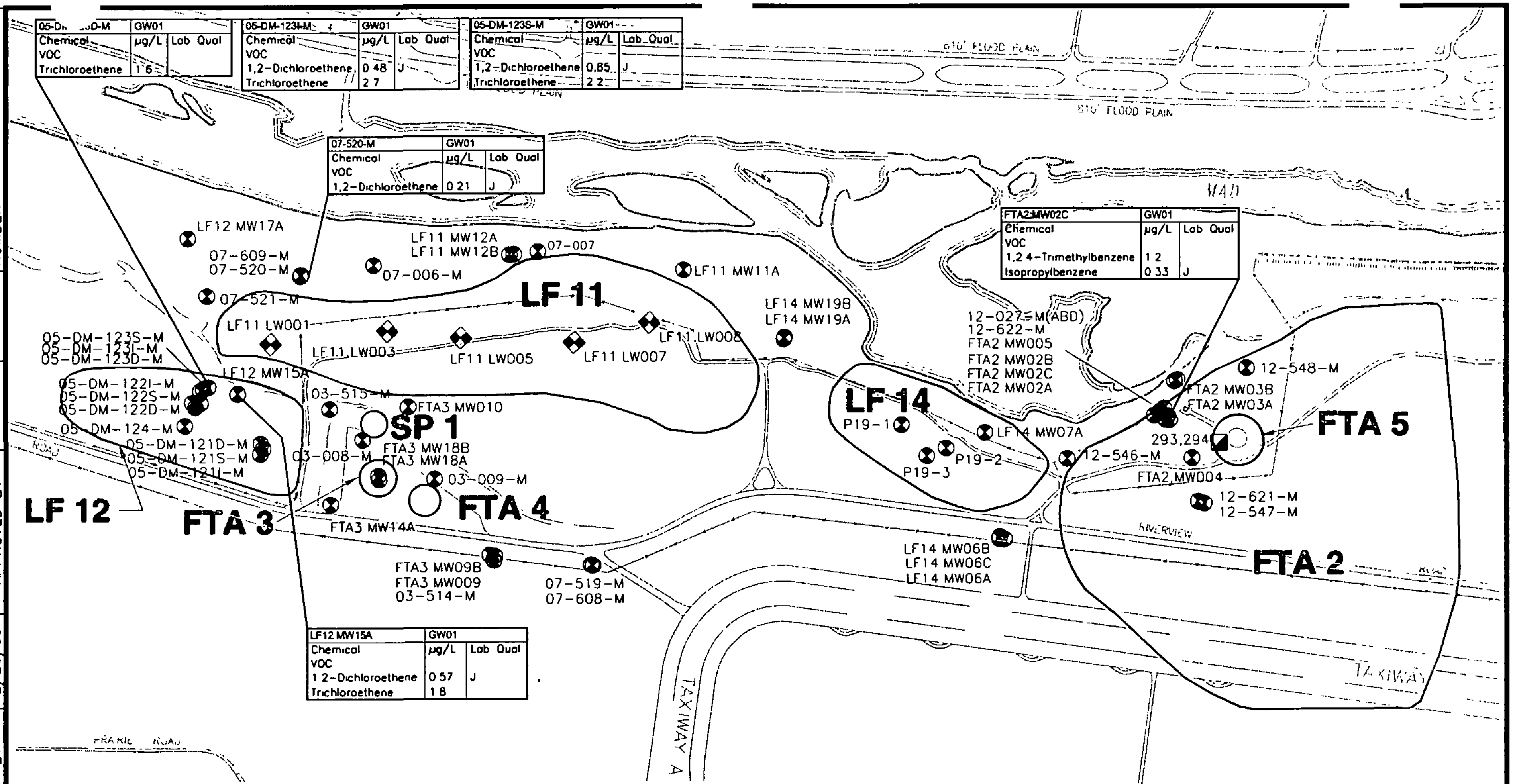


LEGEND

MONITORING WELL LOCATION

ND NOT DETECTED

IRP SITES (LOCATIONS APPROXIMATE)

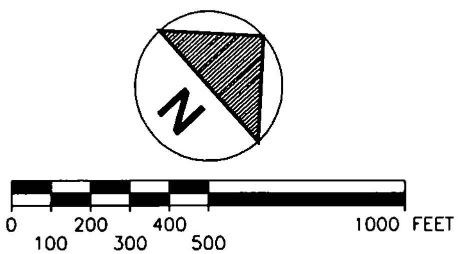


Figure 6-4
OU3 Detected Chemicals of Concern: October 1998

PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

DRAWING NUMBER	GP	CHECKED BY	APPROVED BY	MSN	DRAWN BY
9843-10.DWG 6/21/99				2/26/99	

FILE 9843-10 DWG CLOSED 6/21/99 AT 10 33 AM

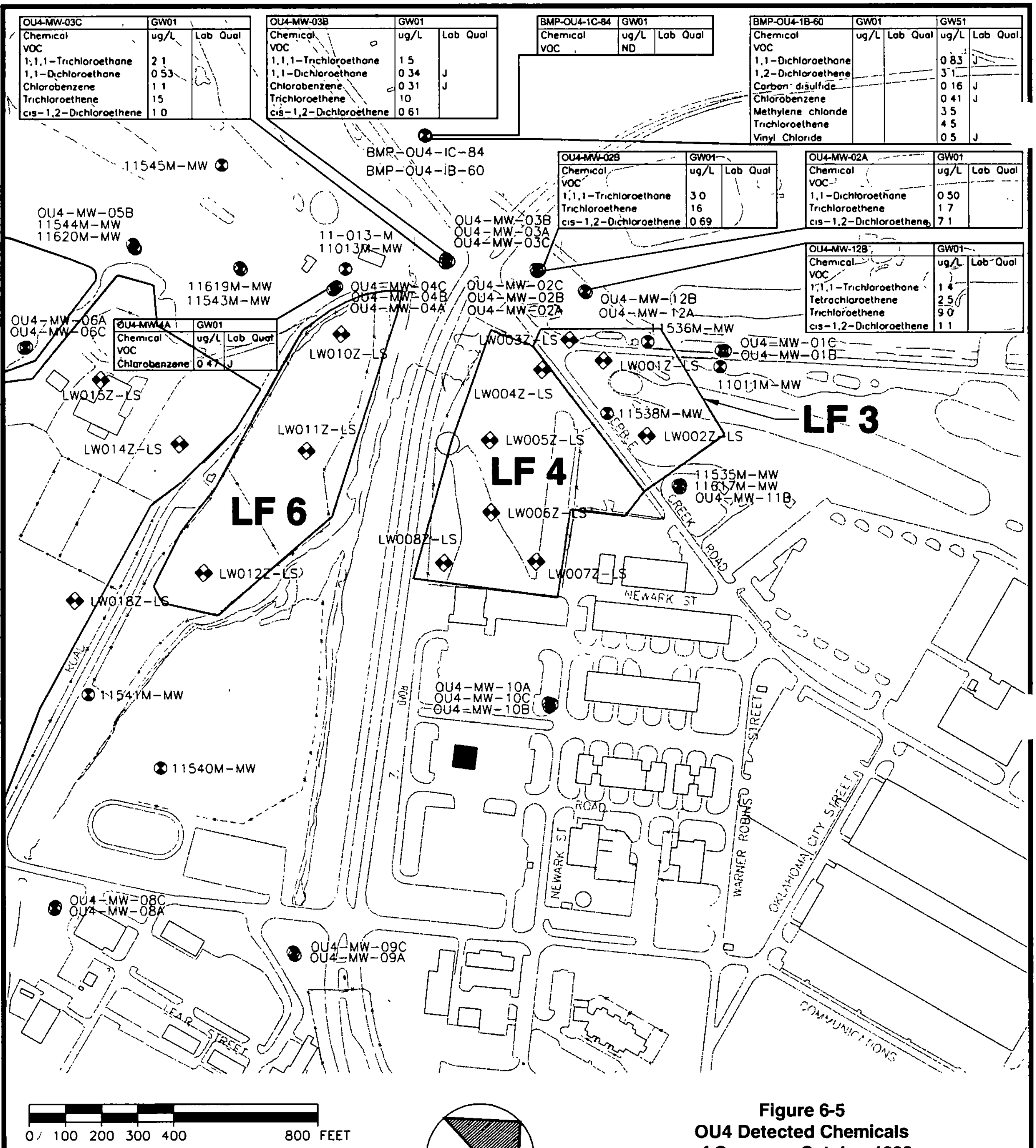


Figure 6-5
OU4 Detected Chemicals of Concern: October 1998

PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

LEGEND

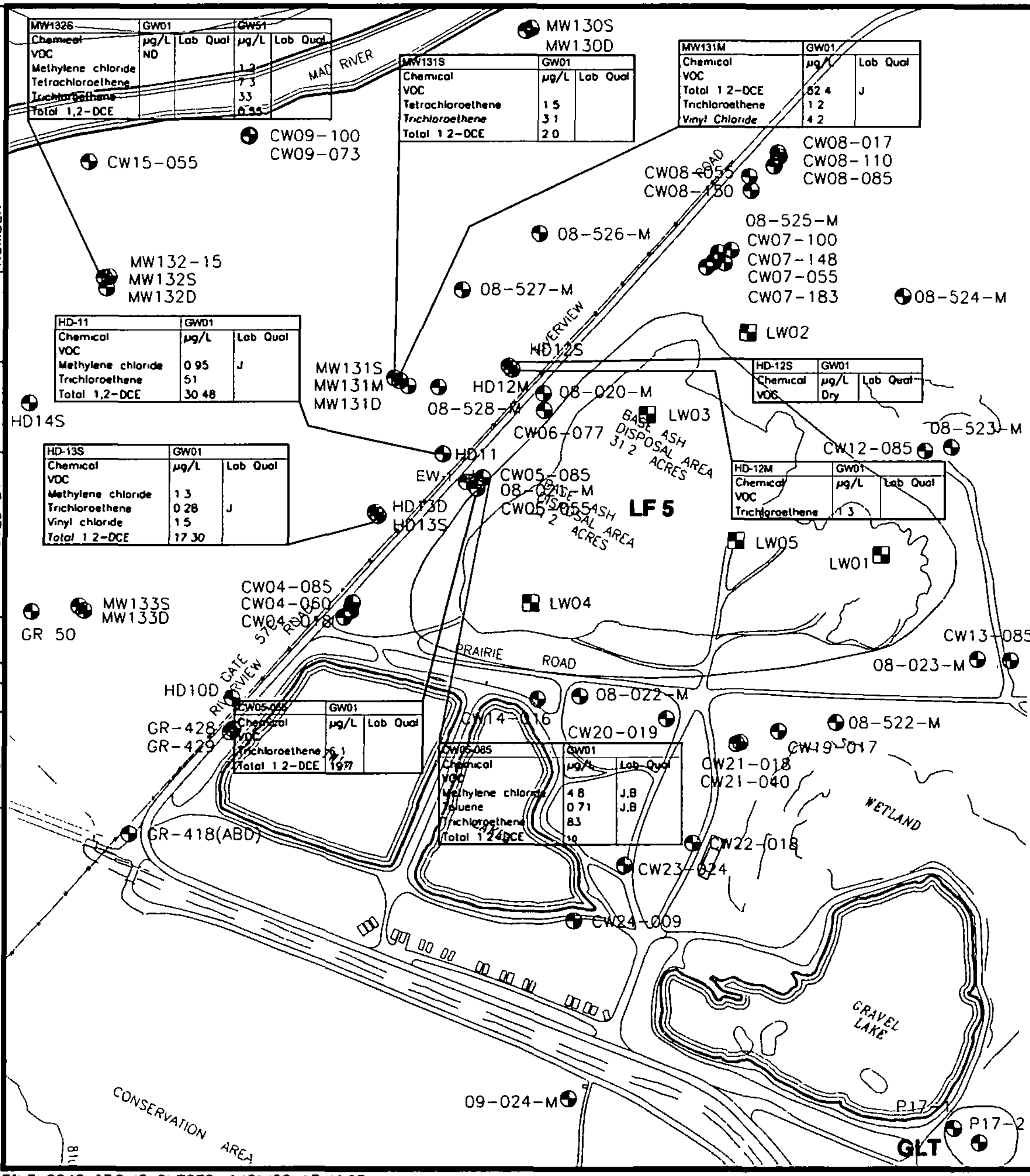
- MONITORING WELL LOCATION
- ND NOT DETECTED
- 15 VOC CONCENTRATION (ug/l) (RED = >MCL)
- IRP SITES (LOCATIONS APPROXIMATE)

INTERNATIONAL TECHNOLOGY CORPORATION

DRAWING NUMBER 9843-11 DWG | 3/31/99 | GP | CHECKED BY | APPROVED BY | MSN 2/26/99 | DRAWN BY

FILE 9843-11 DWG CLOSED 3/31/99 AT 2 41 PM

DRAWING NUMBER 9843-07 DWG | DRAWN BY | MSN 2/3/99 | CHECKED BY APPROVED BY | GP 6/21/99



MW132S	GW01		GW51	
Chemical	µg/L	Lab Qual	µg/L	Lab Qual
VOC	ND			
Methylene chloride			1 2	
Tetrachloroethene			7 3	
Trichloroethene			33	
Total 1,2-DCE			0 55	

MW131S	GW01	
Chemical	µg/L	Lab Qual
VOC		
Tetrachloroethene	1 5	
Trichloroethene	3 1	
Total 1 2-DCE	2 0	

MW131M	GW01	
Chemical	µg/L	Lab Qual
VOC		
Total 1 2-DCE	82 4	J
Trichloroethene	1 2	
Vinyl Chloride	4 2	

HD-11	GW01	
Chemical	µg/L	Lab Qual
VOC		
Methylene chloride	0 95	J
Trichloroethene	51	
Total 1,2-DCE	30 48	

HD-12S	GW01	
Chemical	µg/L	Lab Qual
VOC	Dry	

HD-13S	GW01	
Chemical	µg/L	Lab Qual
VOC		
Methylene chloride	1 3	
Trichloroethene	0 28	J
Vinyl chloride	1 5	
Total 1 2-DCE	17 30	

HD-12M	GW01	
Chemical	µg/L	Lab Qual
VOC		
Trichloroethene	1 3	

CW05-055	GW01	
Chemical	µg/L	Lab Qual
VOC		
Trichloroethene	6 1	
Total 1 2-DCE	1977	

CW05-085	GW01	
Chemical	µg/L	Lab Qual
VOC		
Methylene chloride	4 8	J,B
Toluene	0 71	J,B
Trichloroethene	83	
Total 1 2-DCE	10	

LEGEND:

MONITORING WELL LOCATION

0 100 200 300 400 800 FEET

Figure 6-6
OU5 Detected Chemicals of Concern: October 1998

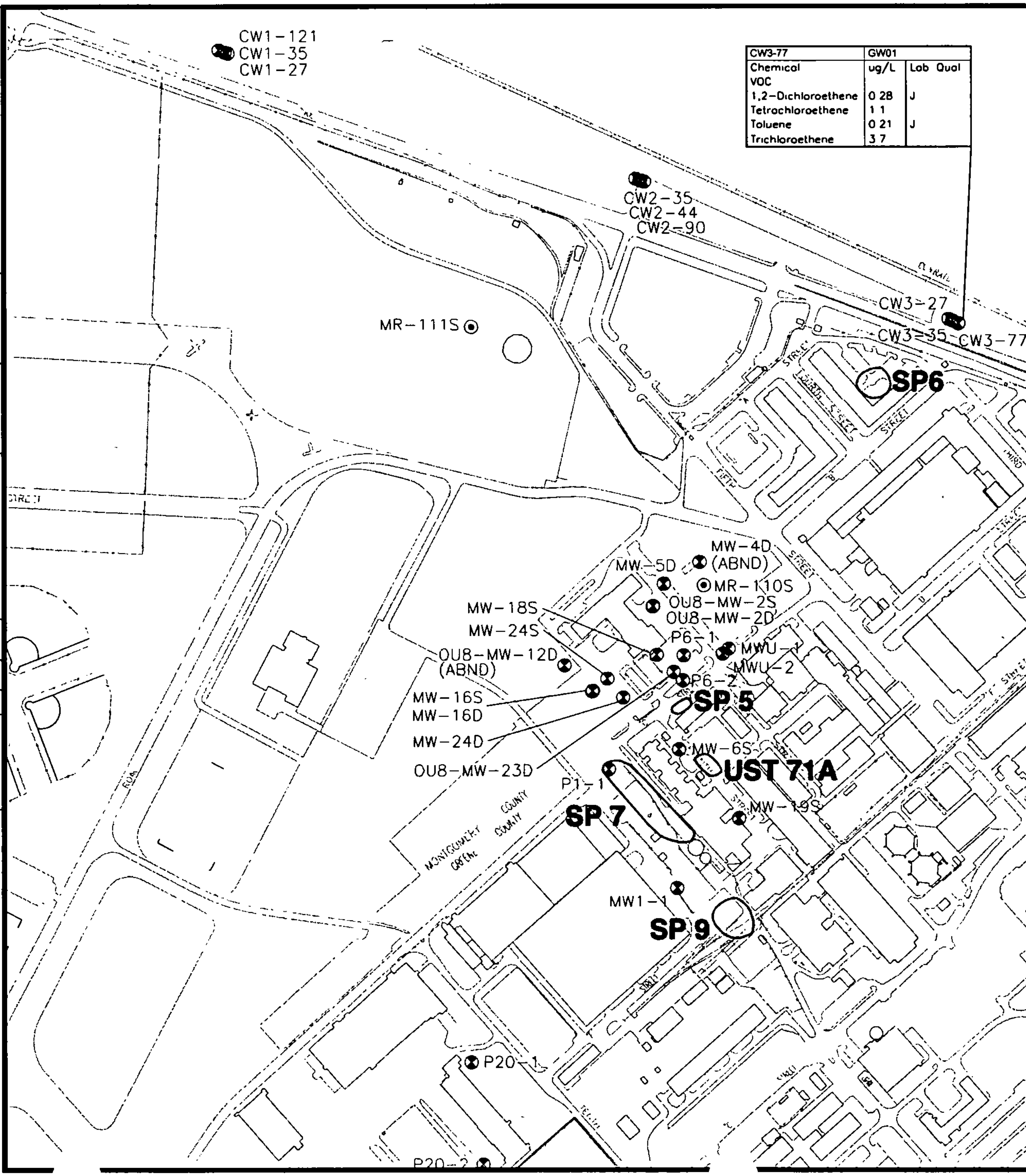
PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

FILE 9843-07 DWG CLOSED 6/21/99 AT 10 27 AM

DRAWN BY	MSN 2/26/99	CHECKED BY / APPROVED BY	GP	3/8/99	DRAWING NUMBER 9843-12.DWG



LEGEND

- MONITORING WELL LOCATION
- IRP SITES (LOCATIONS APPROXIMATE)

N

0 200 400 600 1200 FEET

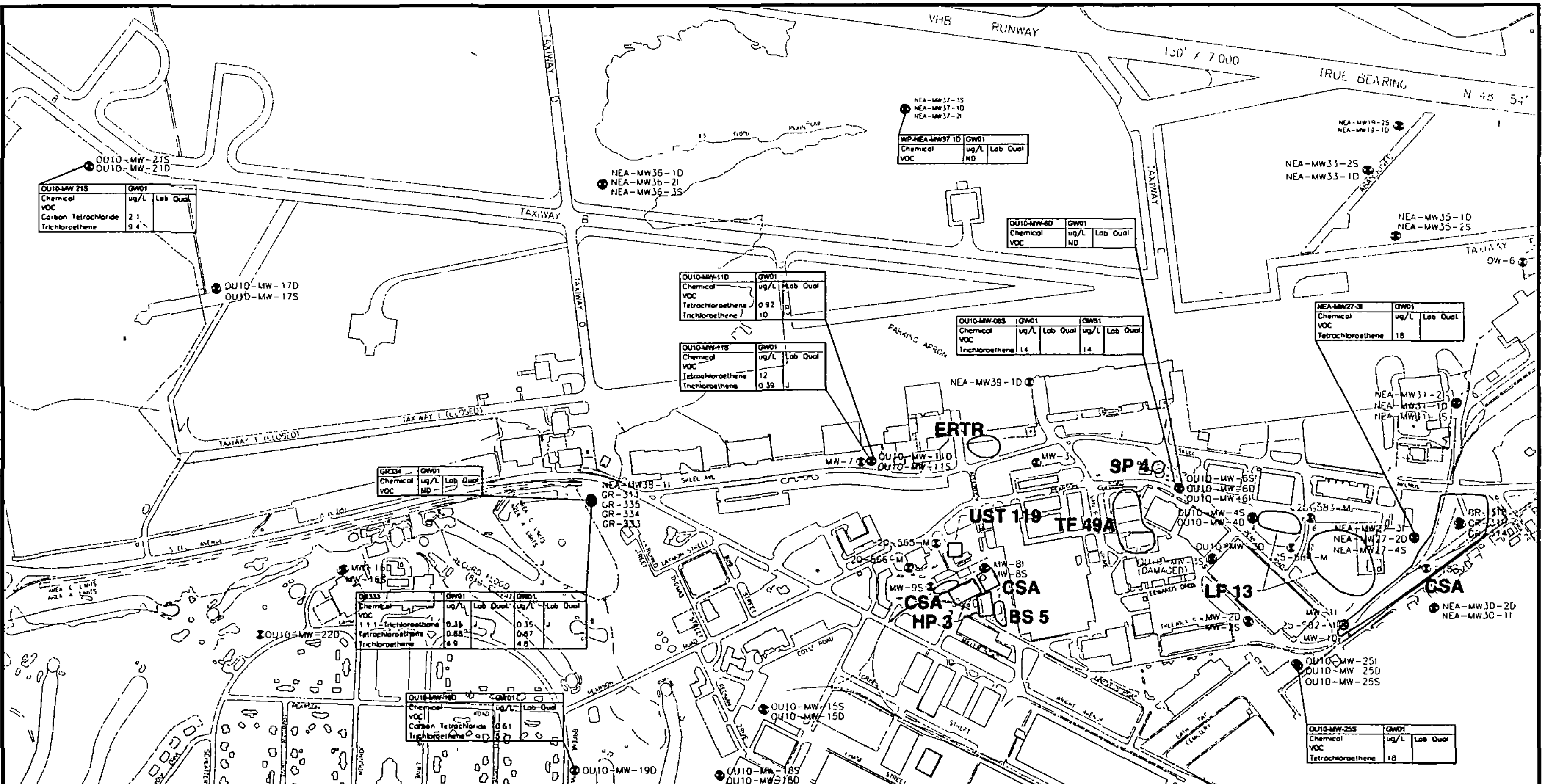
Figure 6-7
OU8 Detected Chemicals of Concern: October 1998

PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

FILE 2DWG CLOSED 3/7/99 AT 7 56 PM



LEGEND

- MONITORING WELL LOCATION
- 9 4 VOC CONCENTRATION (RED=>MCL)
- IRP SITES (LOCATIONS APPROXIMATE)

Figure 6-8
OU 10 Detected Chemicals
of Concern: October 1998

PREPARED FOR

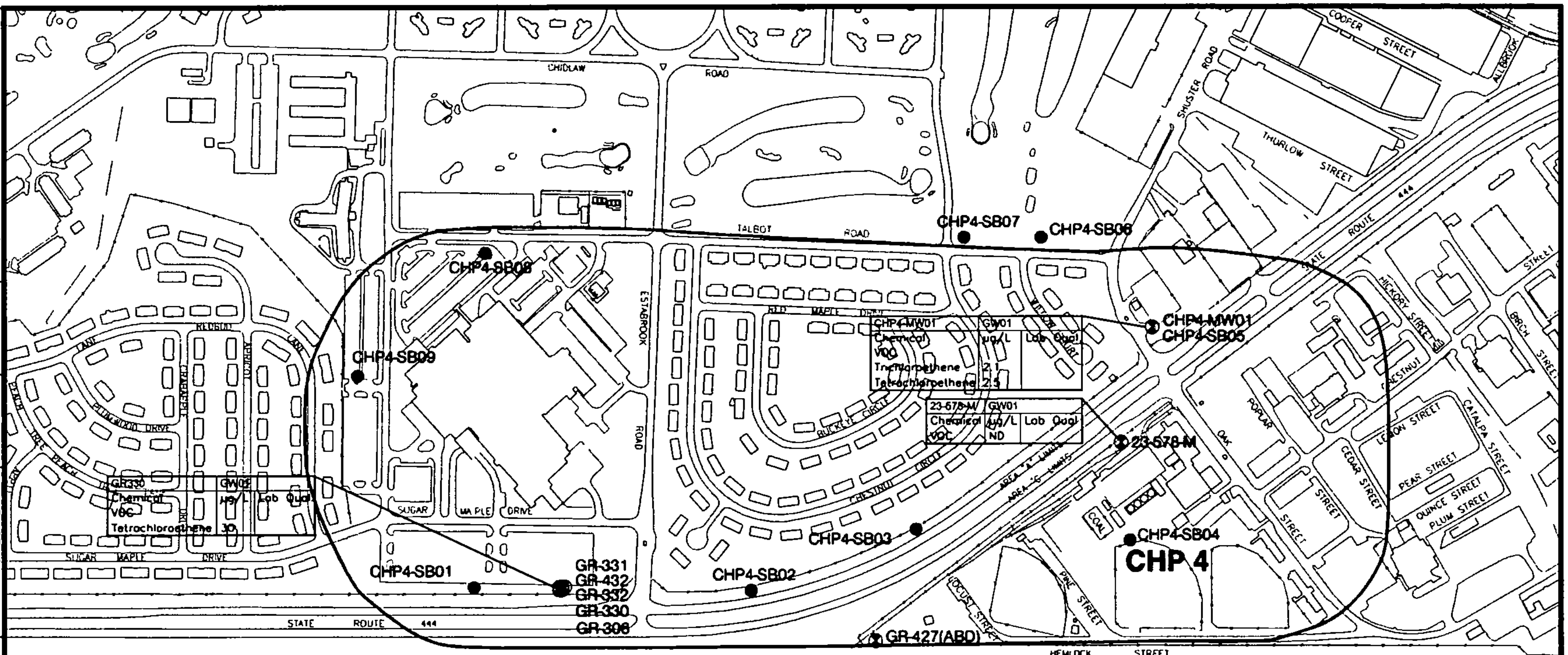
Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

DRAWN BY	MSN 2/26/99	CHECKED BY APPROVED BY	GP	3/8/99	DRAWING NUMBER 9843-13 DWG

FILE 9843-13 DWG CLOSED 3/7/99 AT 8 08 PM

DRAWING NUMBER 9843-14 DWG | 6/22/99 | GP | CHECKED BY | APPROVED BY | MSN 2/26/99 | DRAWN BY



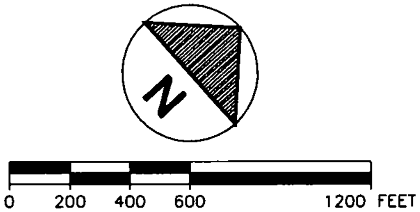


Figure 6-9
Central Heating Plant 4 (OU10)
Detected Chemicals of Concern:
October 1998

PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND

MONITORING WELL LOCATION

IRP SITES (LOCATIONS APPROXIMATE)

F ?843-14 DWG CLOSED 6/22/99 AT 7 46 AM

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: BS5
WPAFB - LTM Program

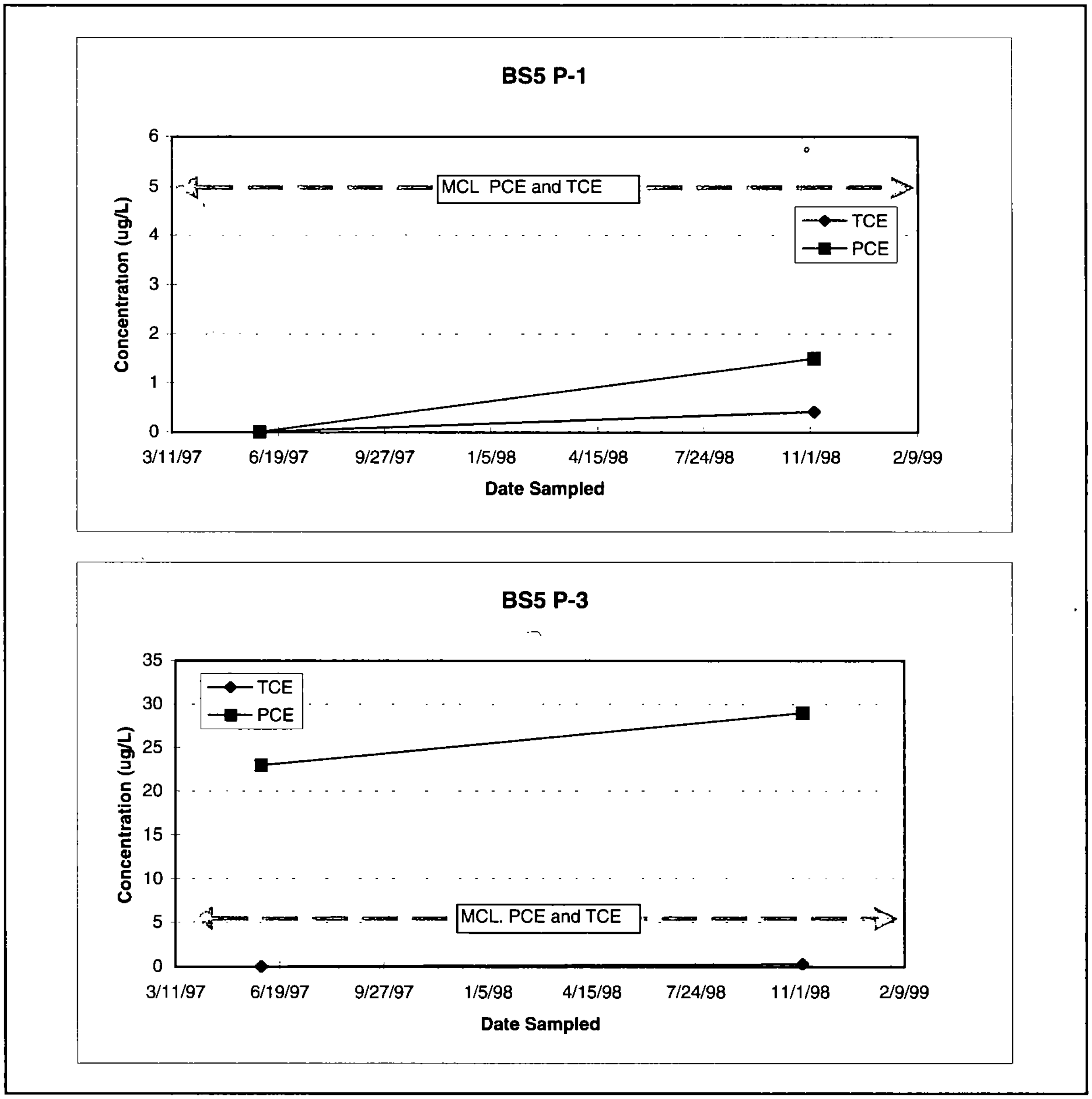
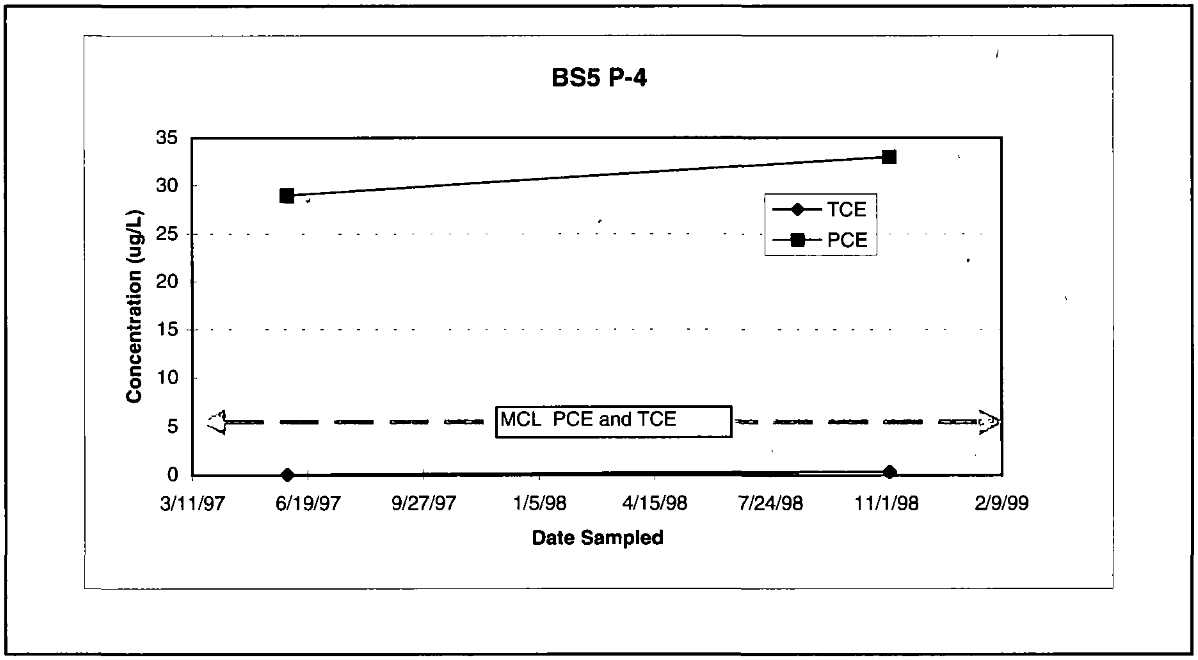
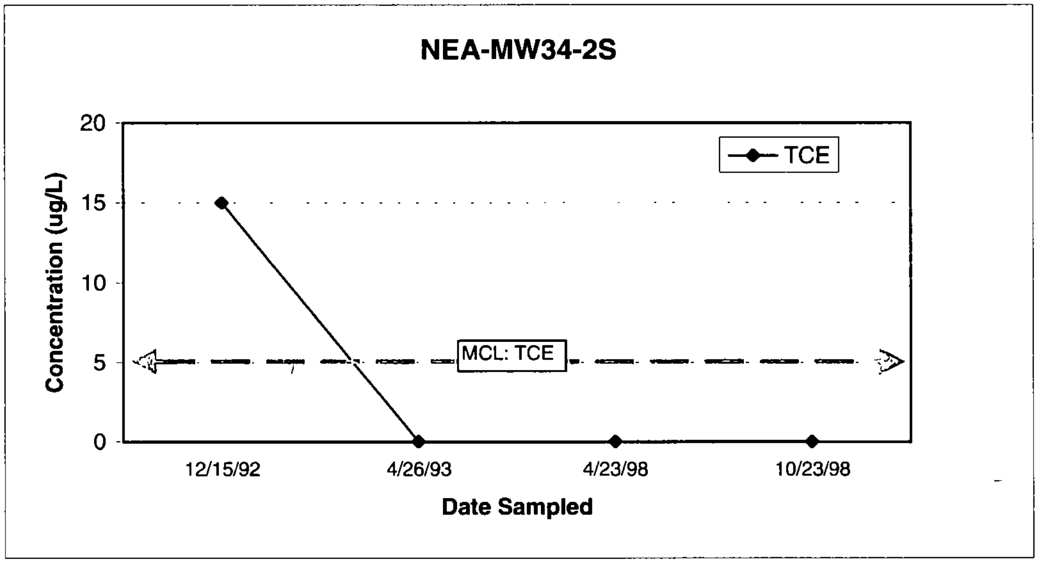


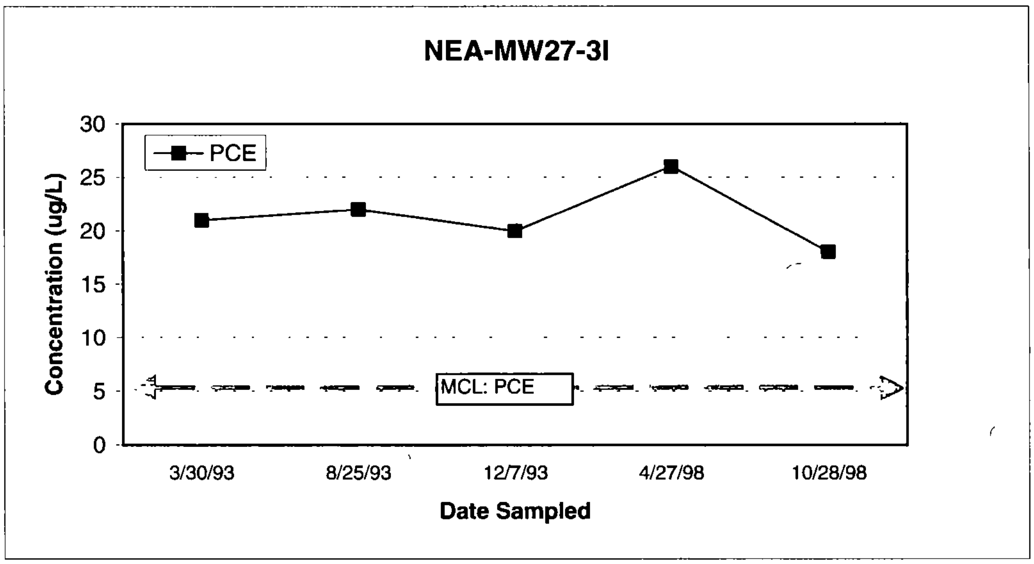
FIGURE 6-10

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: BS5
WPAFB - LTM Program



LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU2
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU3
WPAFB - LTM Program

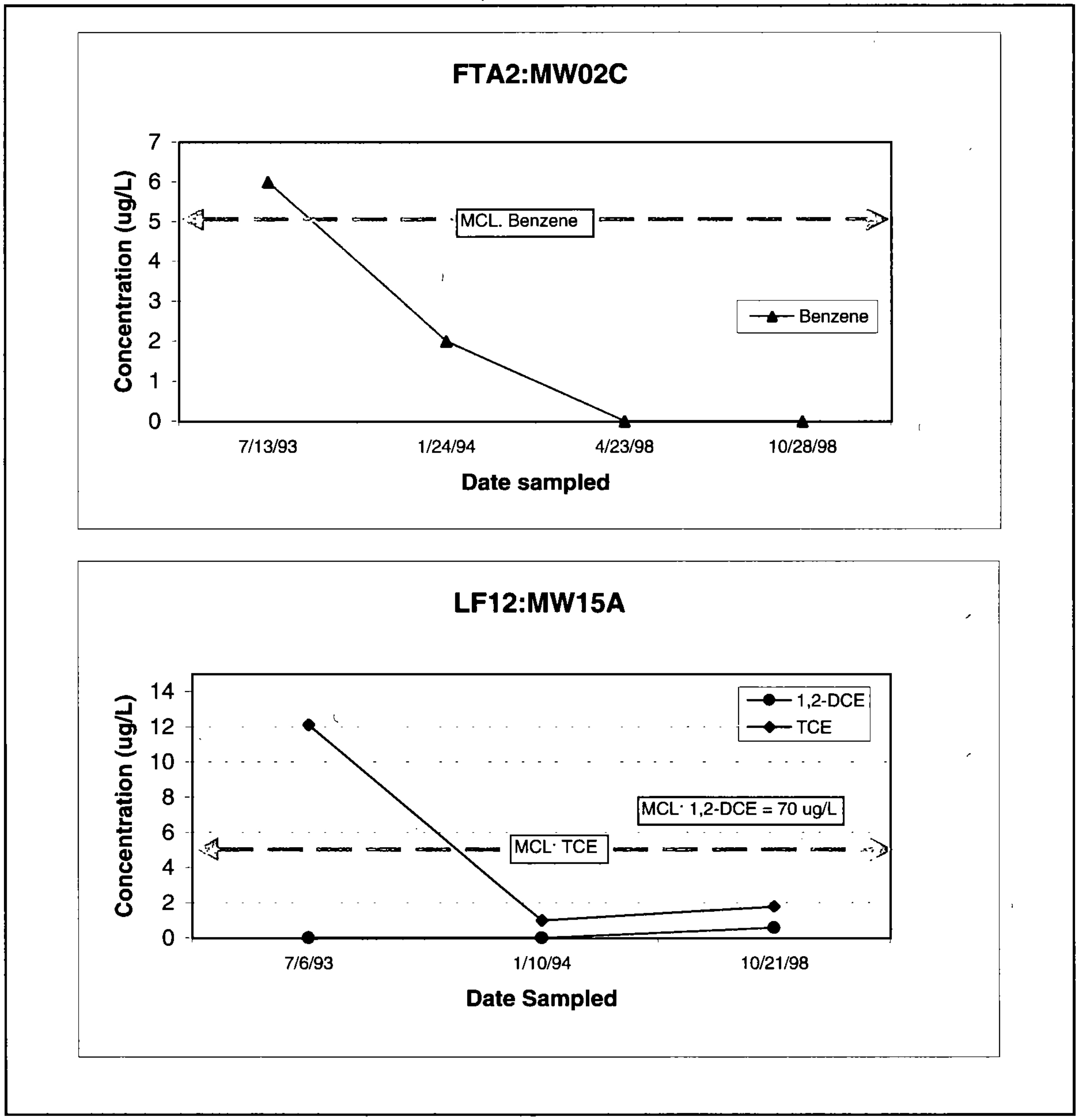
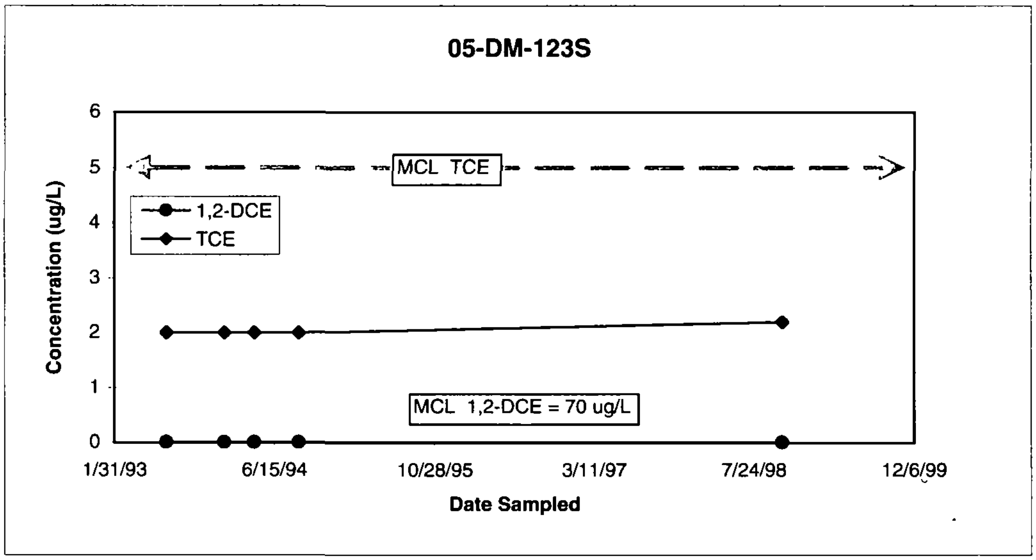
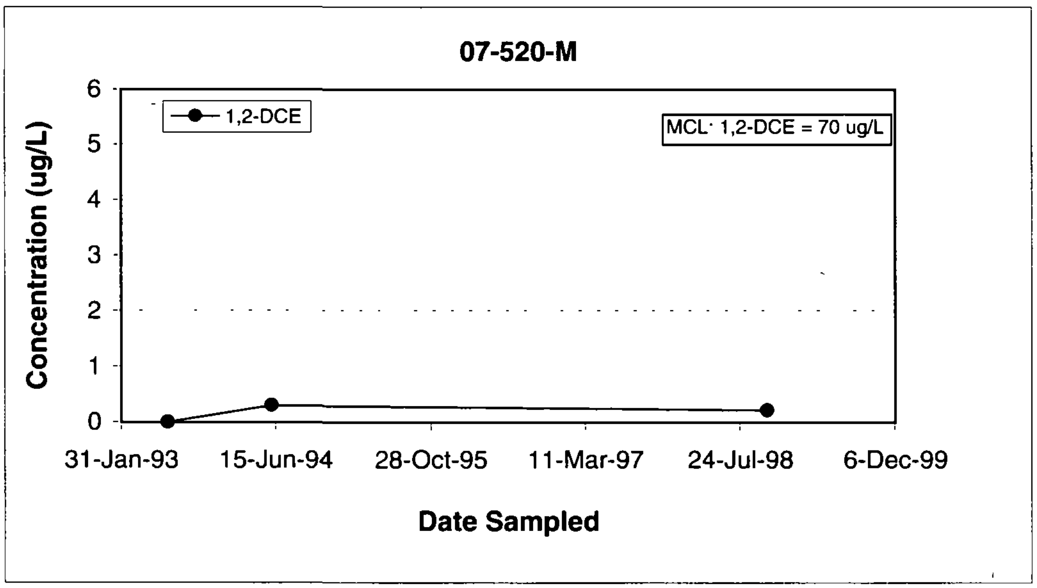


FIGURE 6-13

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU3
WPAFB - LTM Program

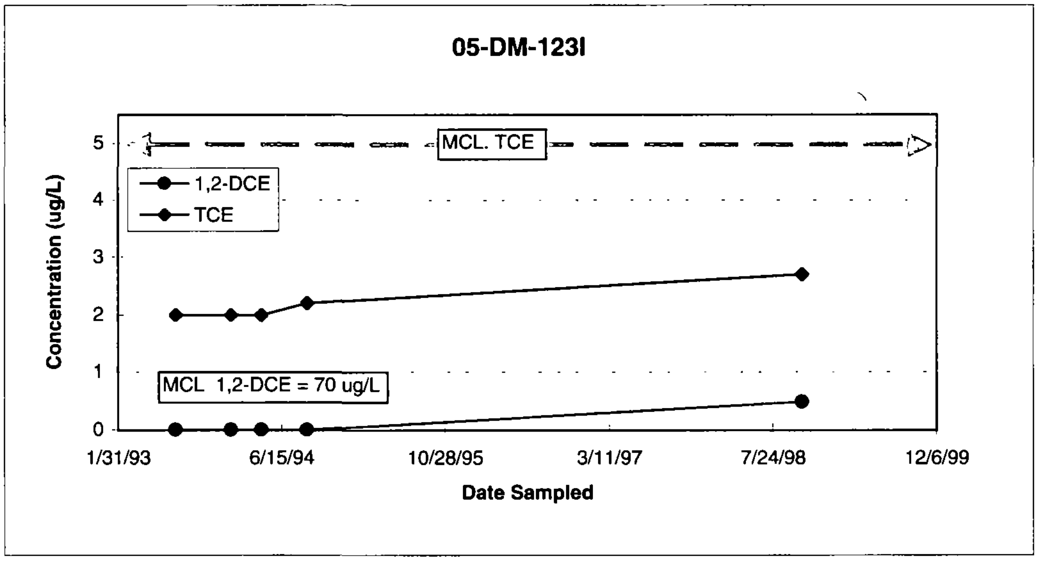


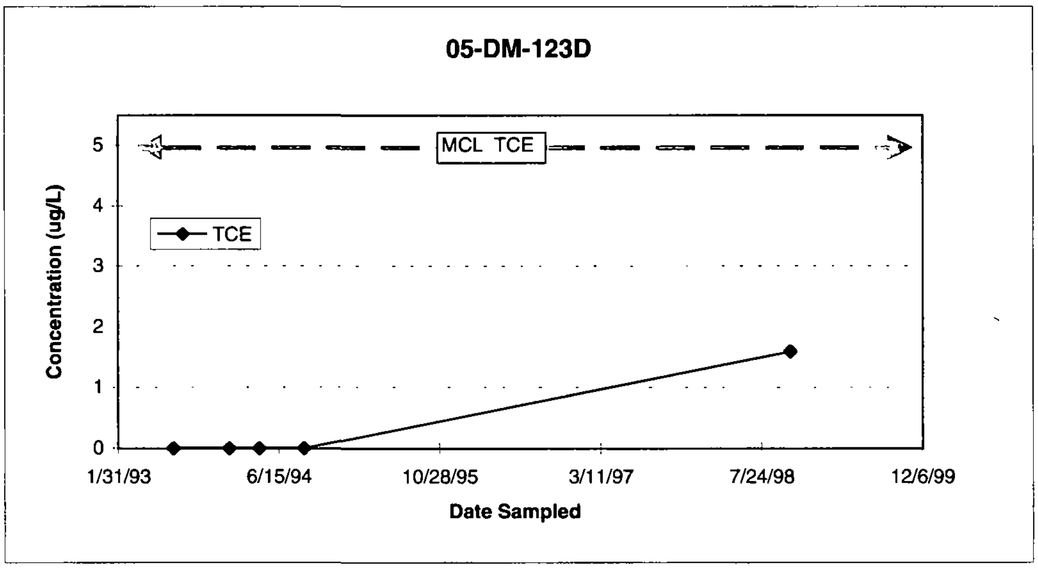


common1/plamondo/Ltm/Figures/Rnd1_graphs xls/OU3(2)

FIGURE 6-14

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU3
WPAFB - LTM Program





common1/plamondo/Ltm/Figures/Rnd1_graphs xls/OU3(3)

FIGURE 6-15

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU4
WPAFB - LTM Program

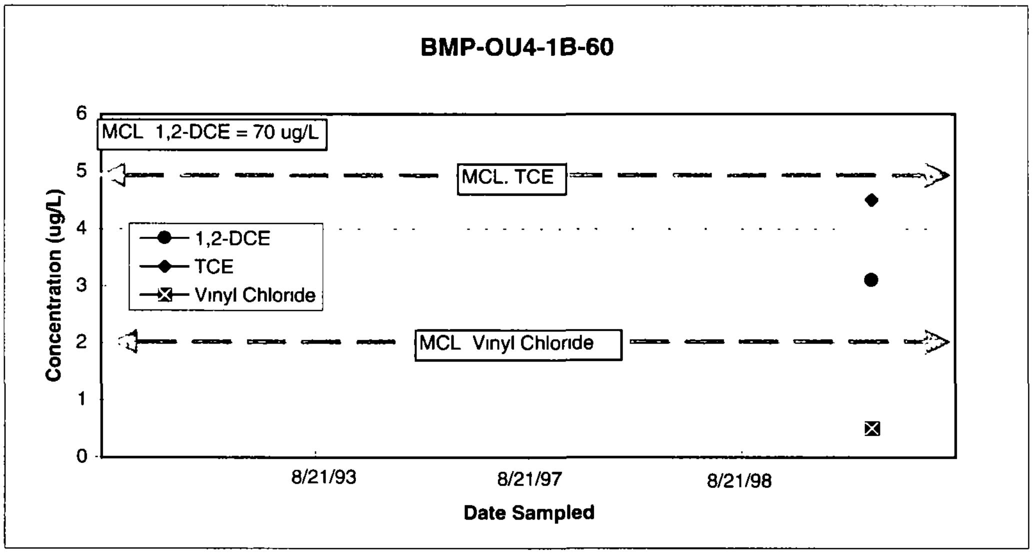
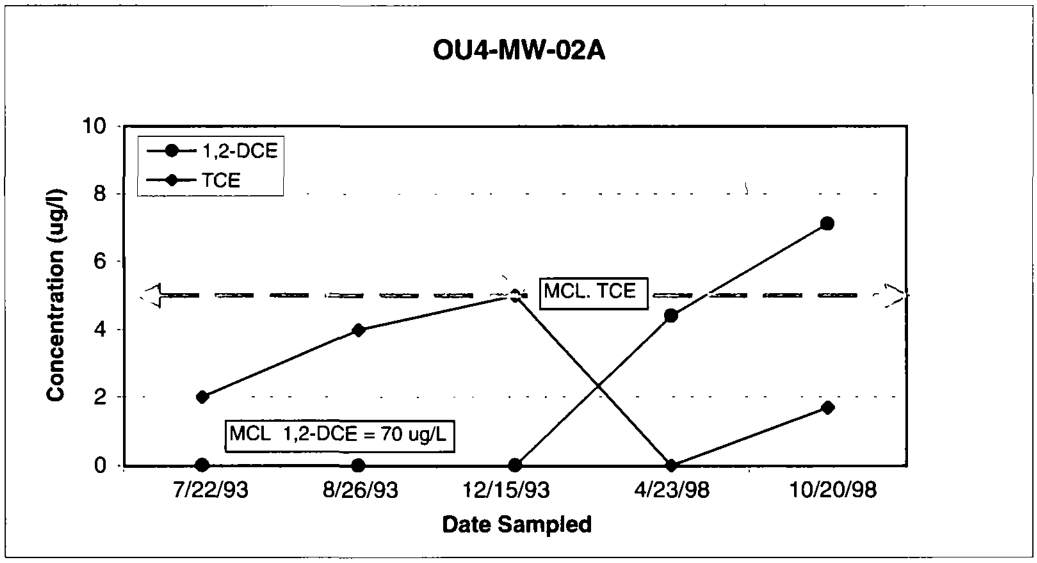


FIGURE 6-16

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU4
WPAFB - LTM Program



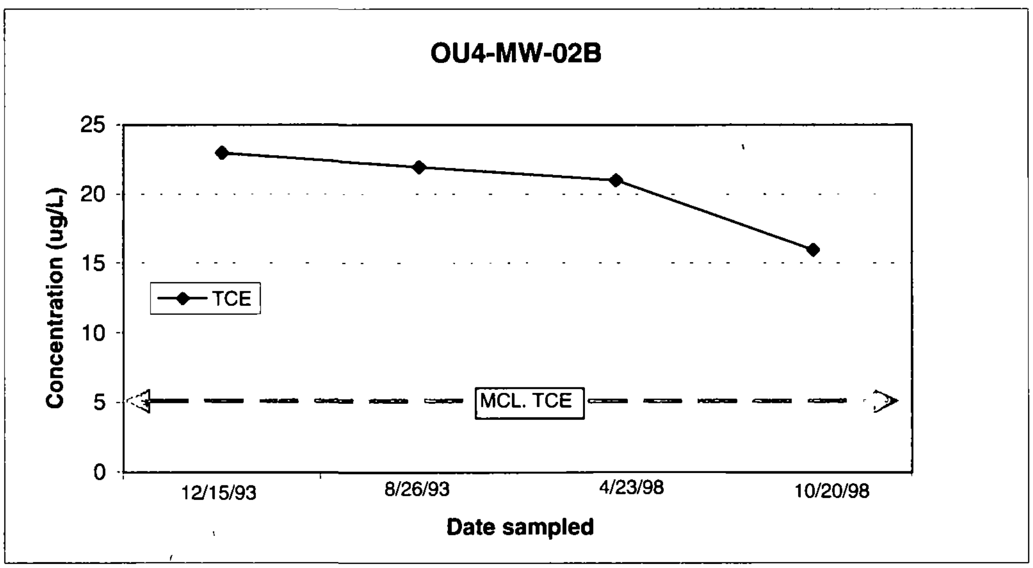
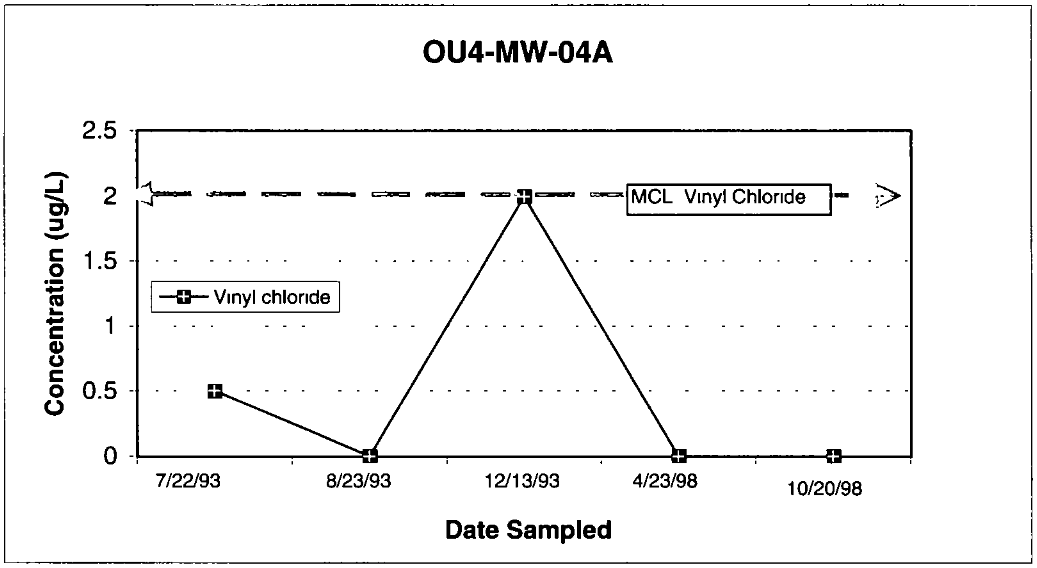
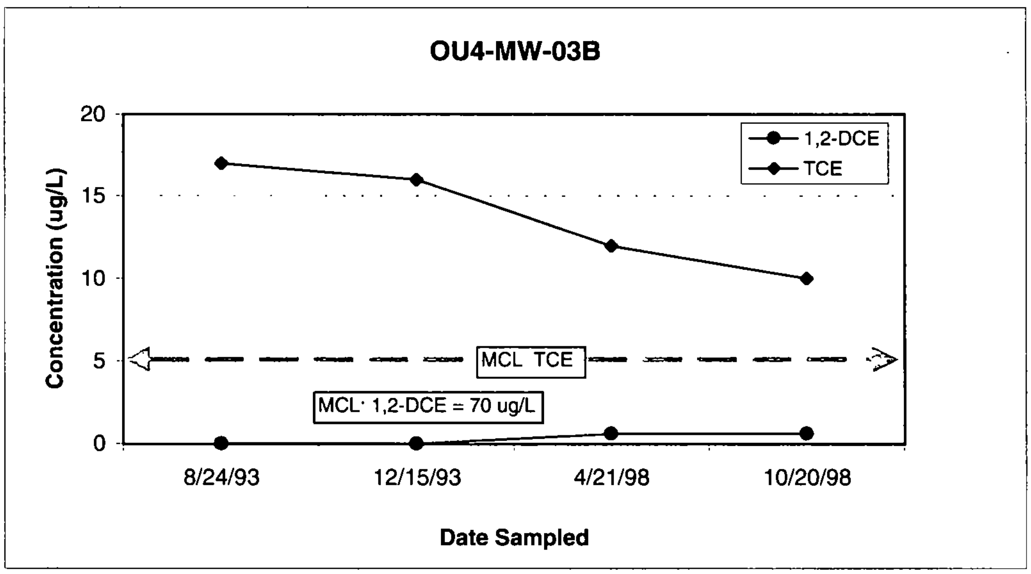


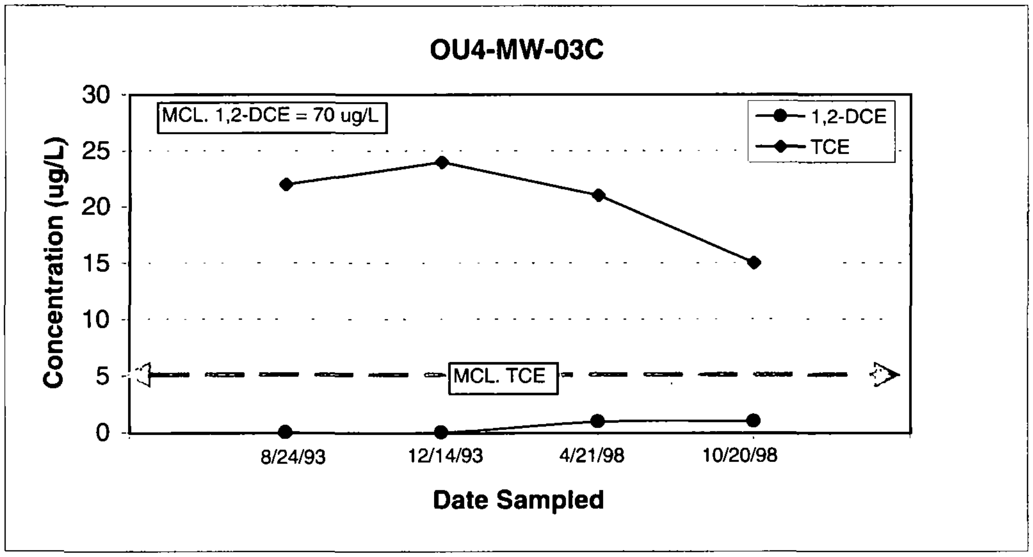
FIGURE 6-17

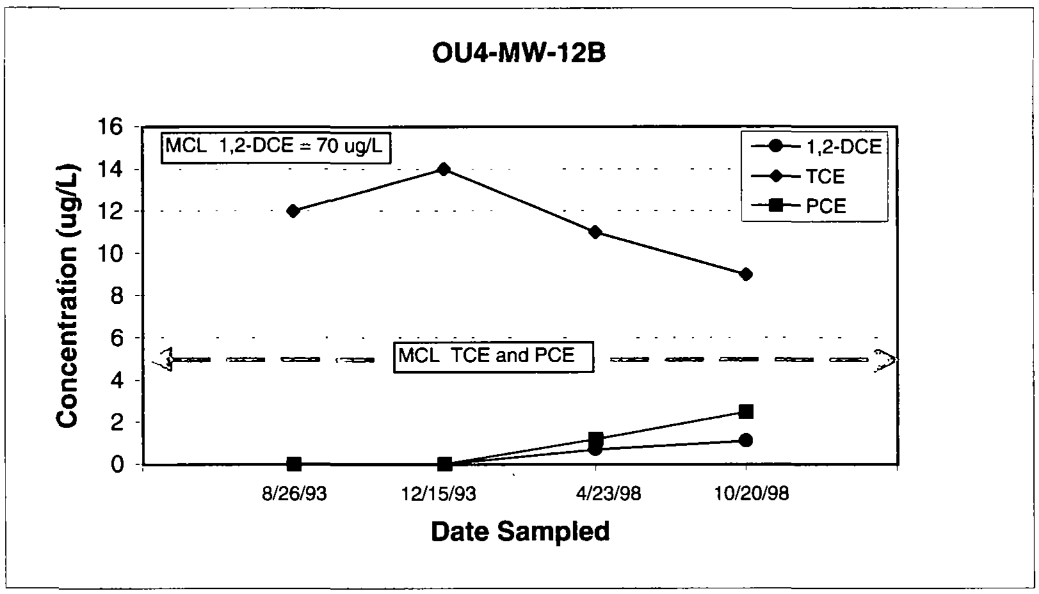
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU4
WPAFB - LTM Program



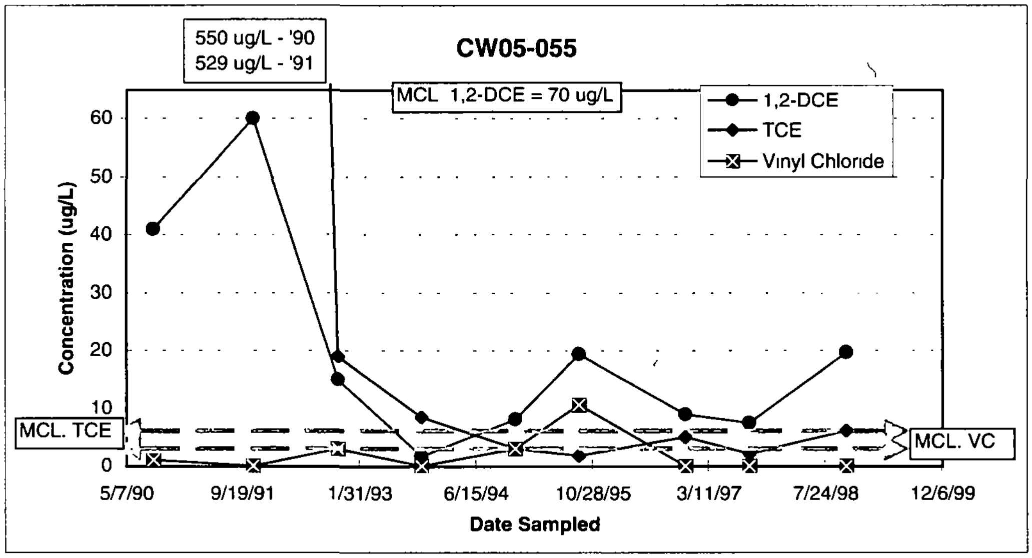


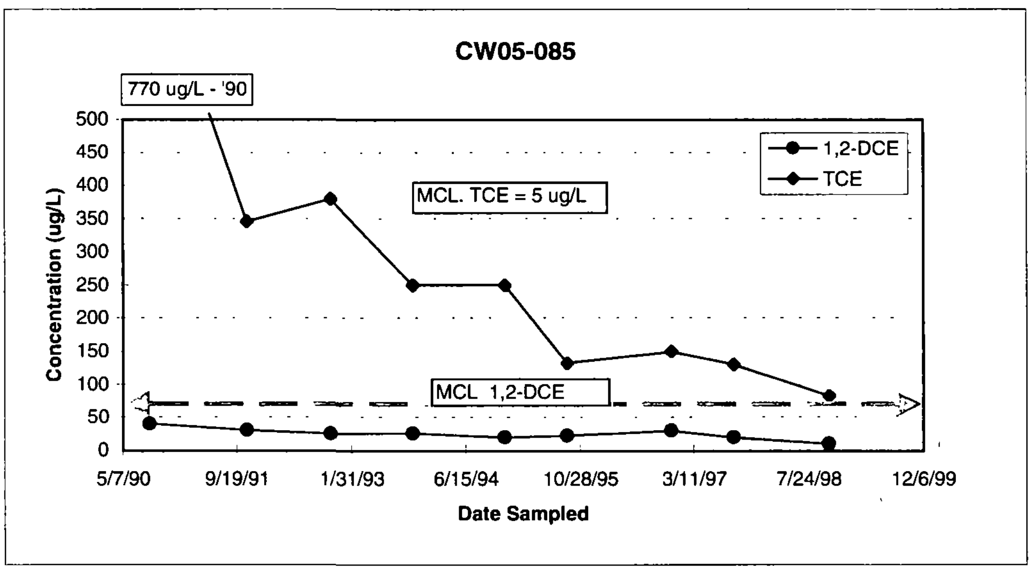
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU4
WPAFB - LTM Program



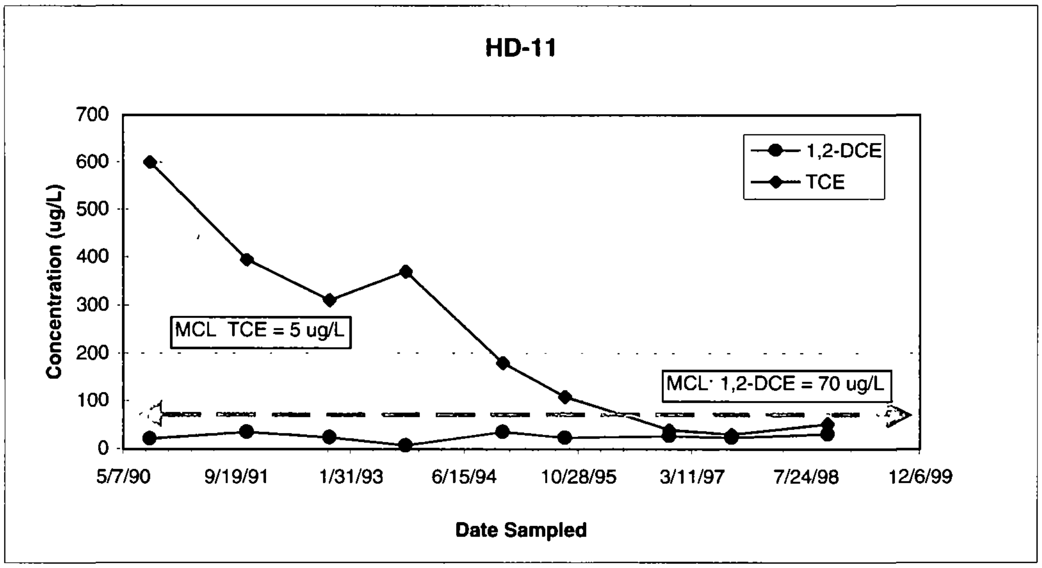


LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5 (FAA-A)
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5 (FAA-A)
WPAFB - LTM Program



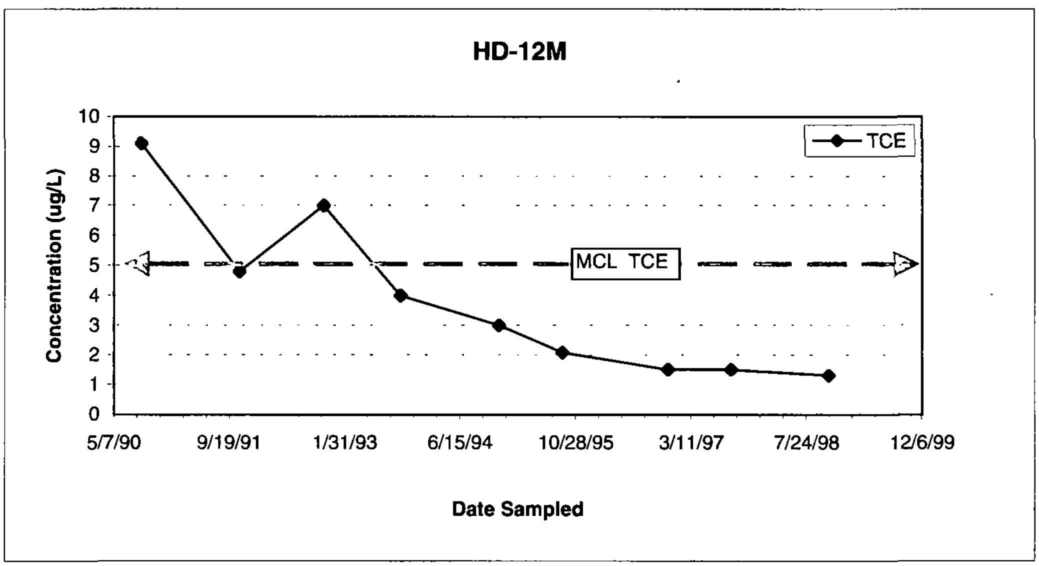
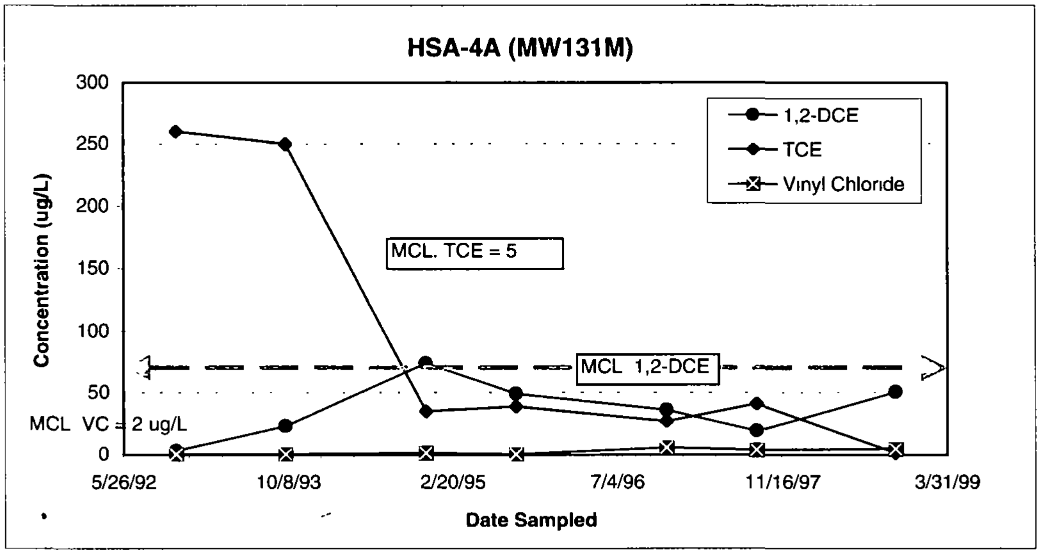


FIGURE 6-21

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5 (FAA-A)
WPAFB - LTM Program



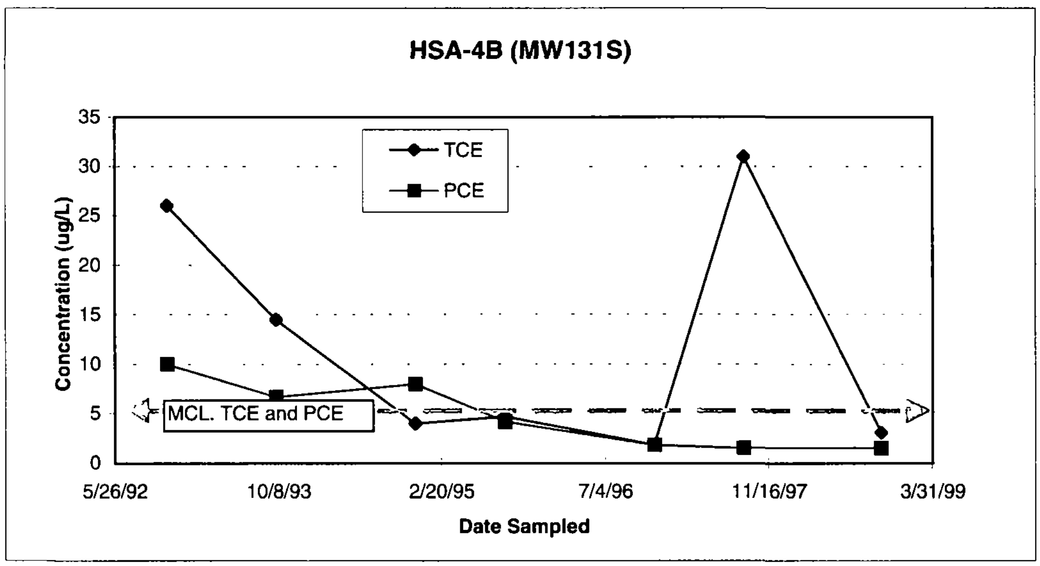
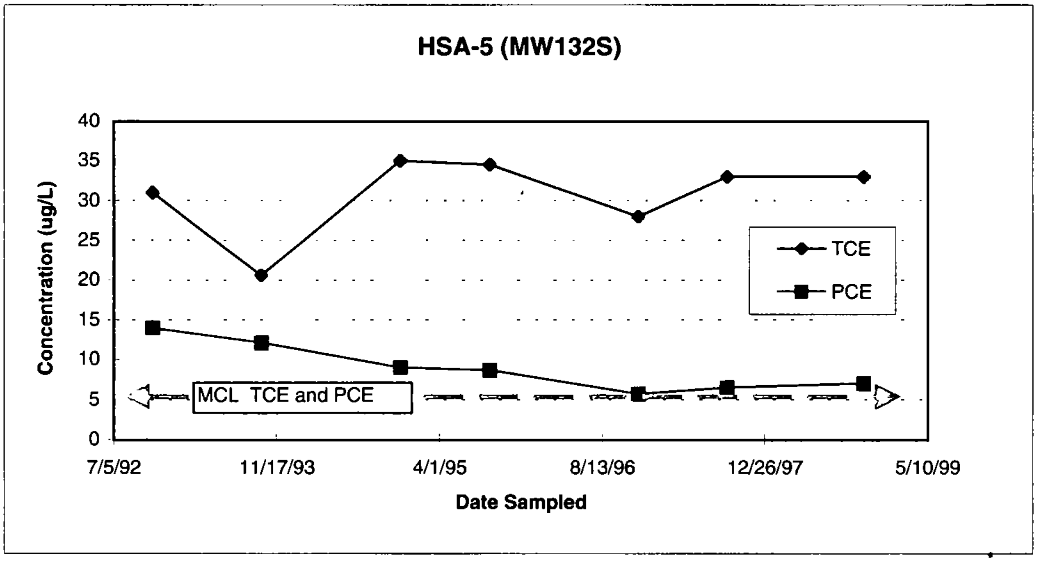
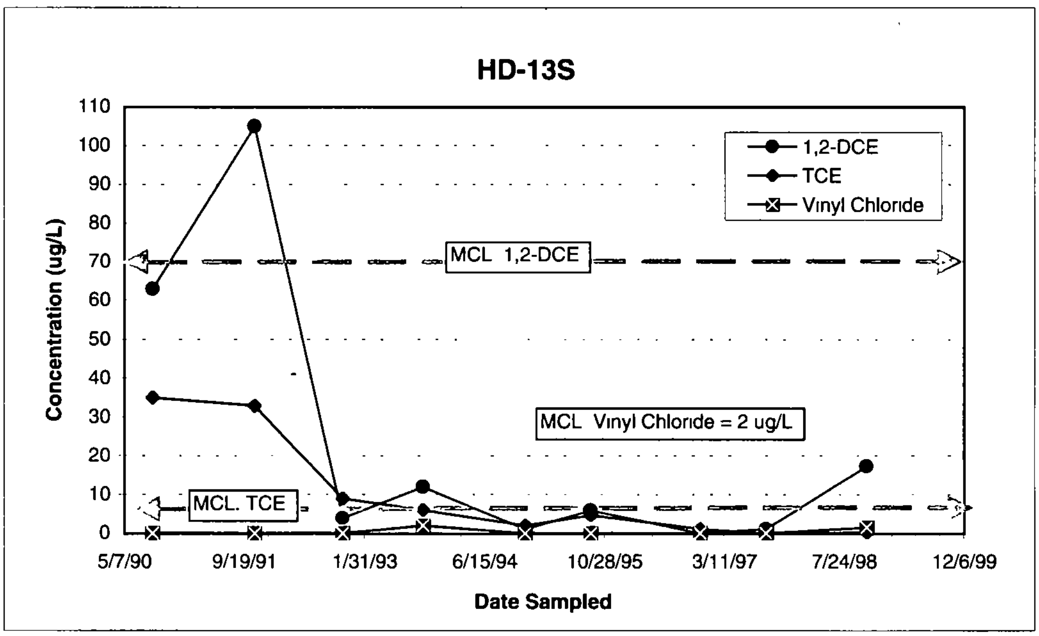


FIGURE 6-22

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5 (FAA-A)
WPAFB - LTM Program

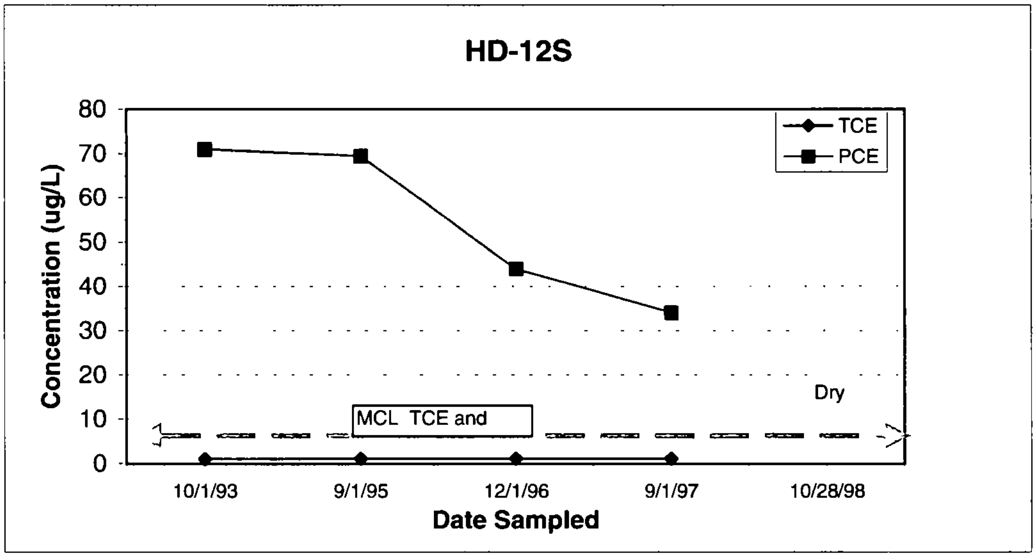




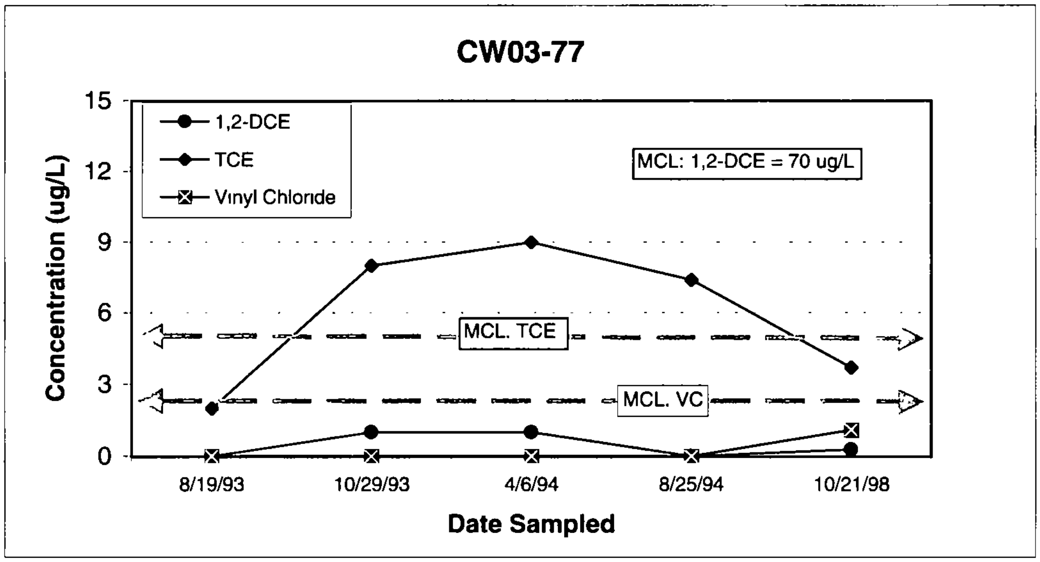
commonl/plamondo/Ltm/Figures/Rnd1_graphs xls/OU5(4)

FIGURE 6-23

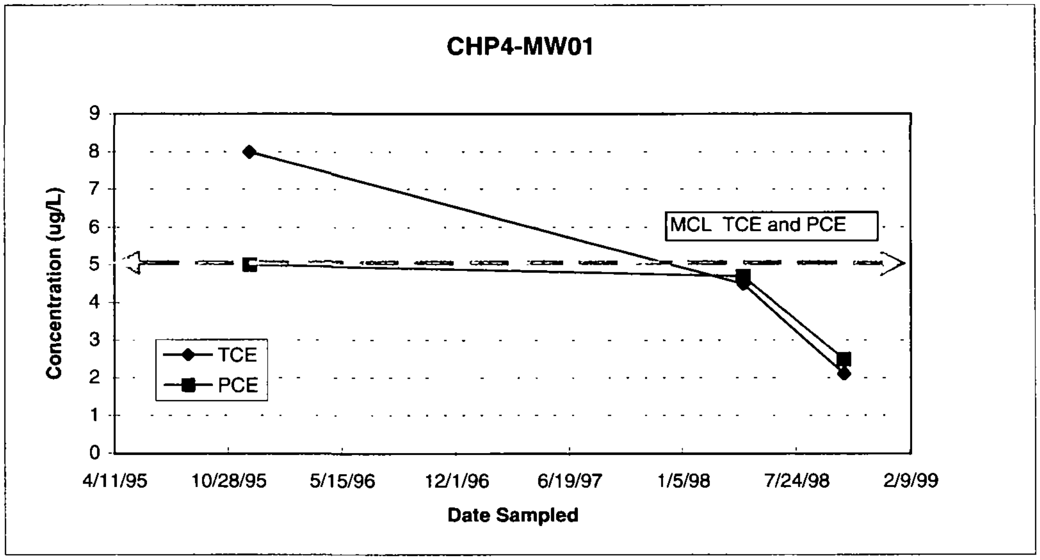
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5
WPAFB - LTM Program

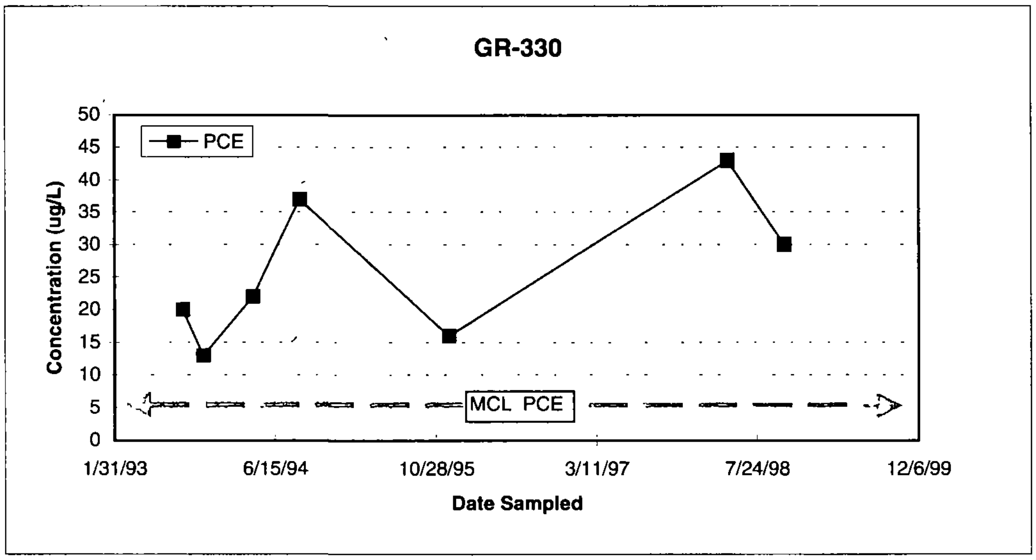


LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU8
WPAFB - LTM Program

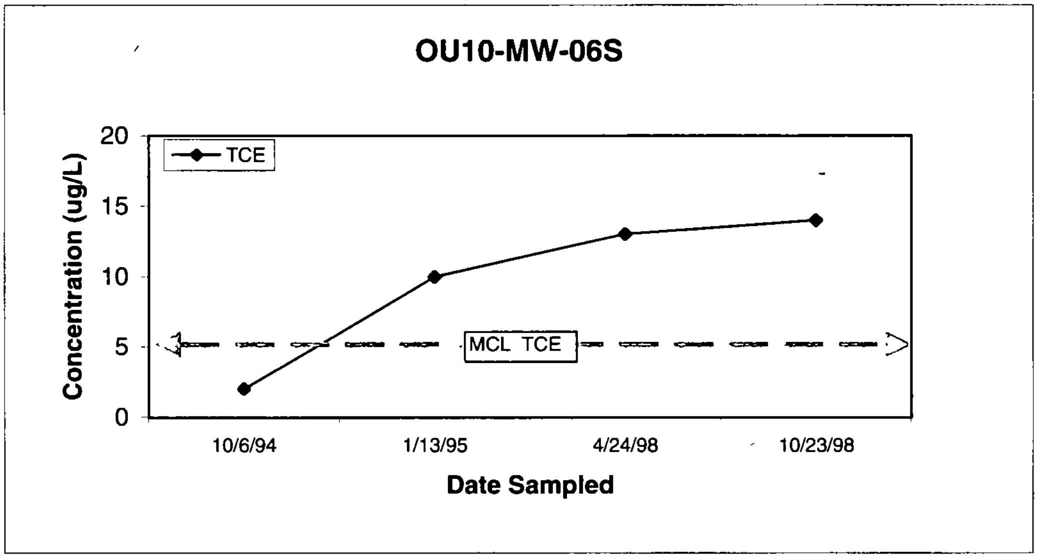


LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program



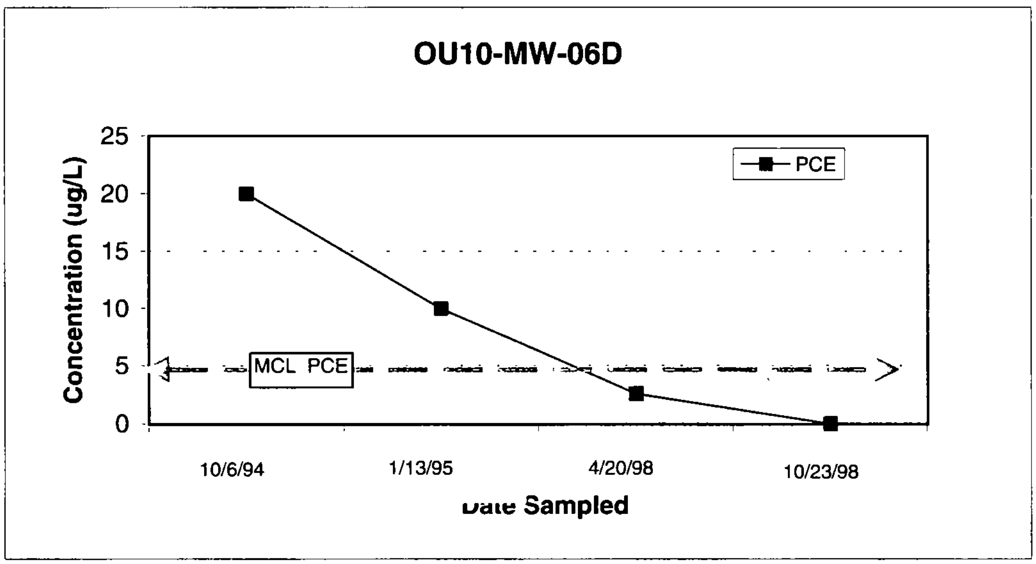
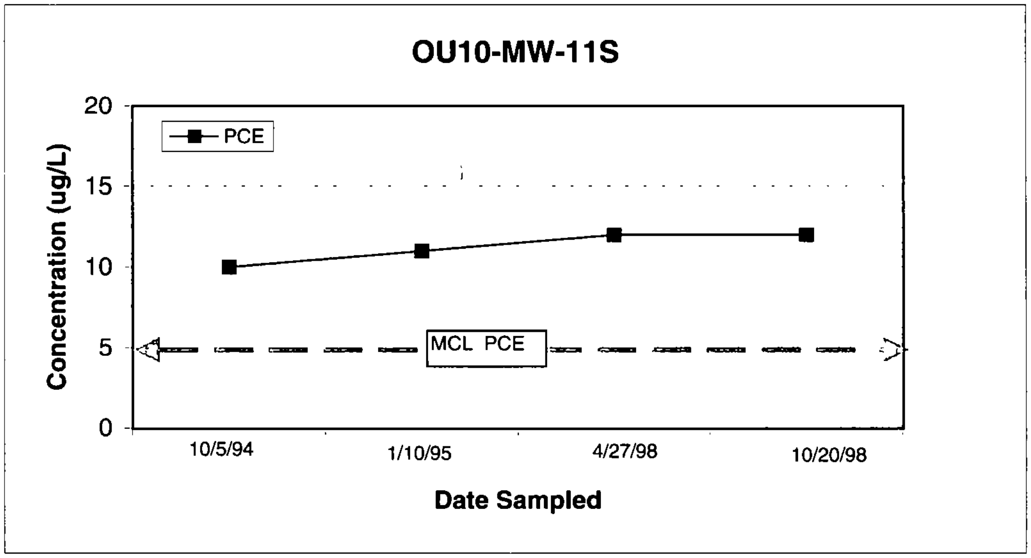


FIGURE 6-27

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program



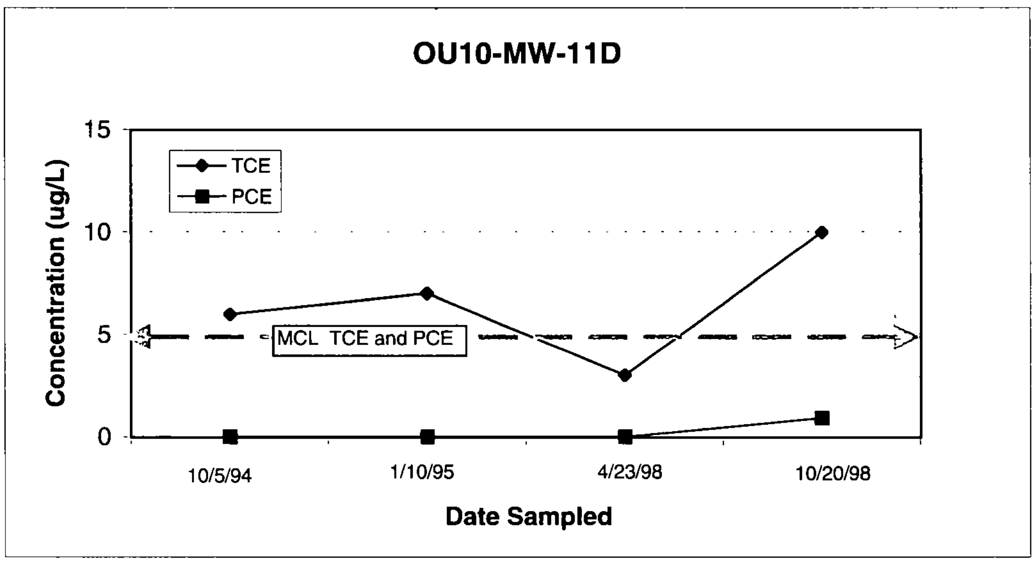
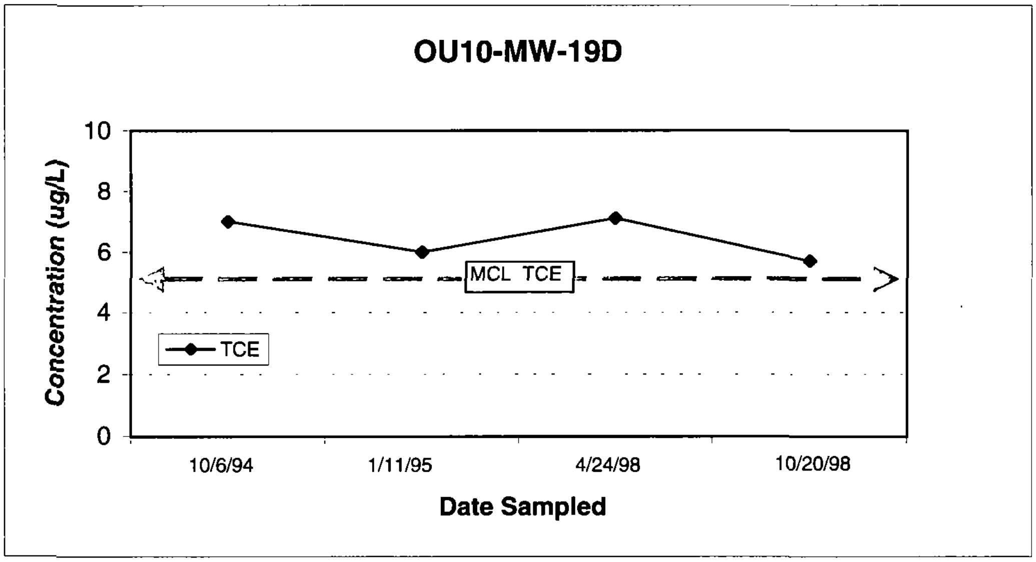
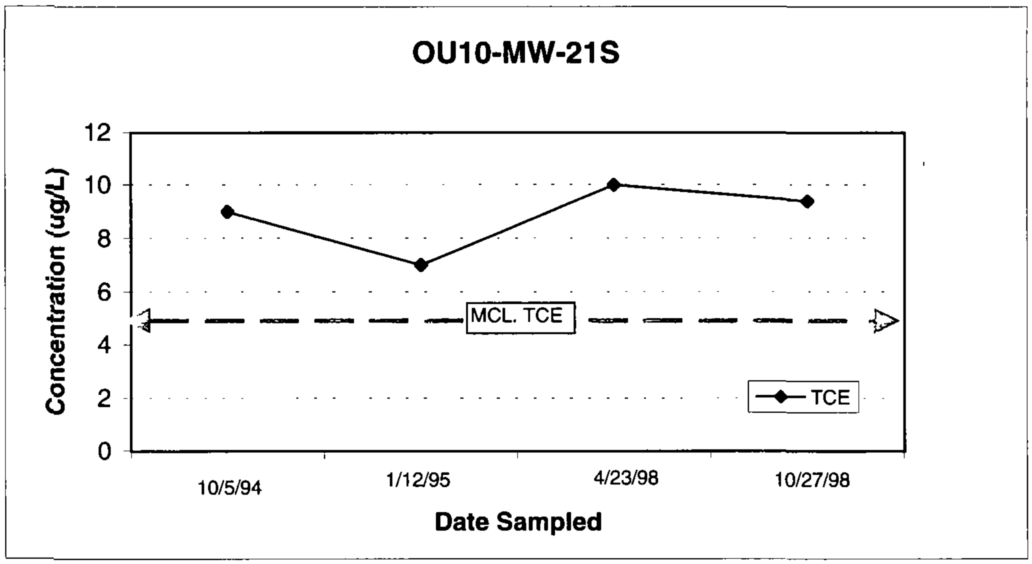


FIGURE 6-28

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program

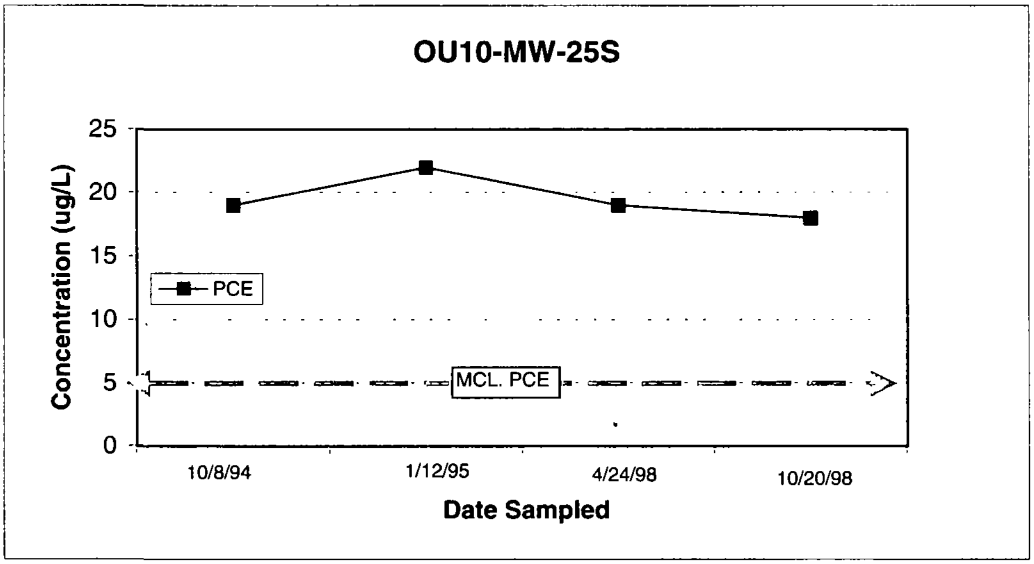


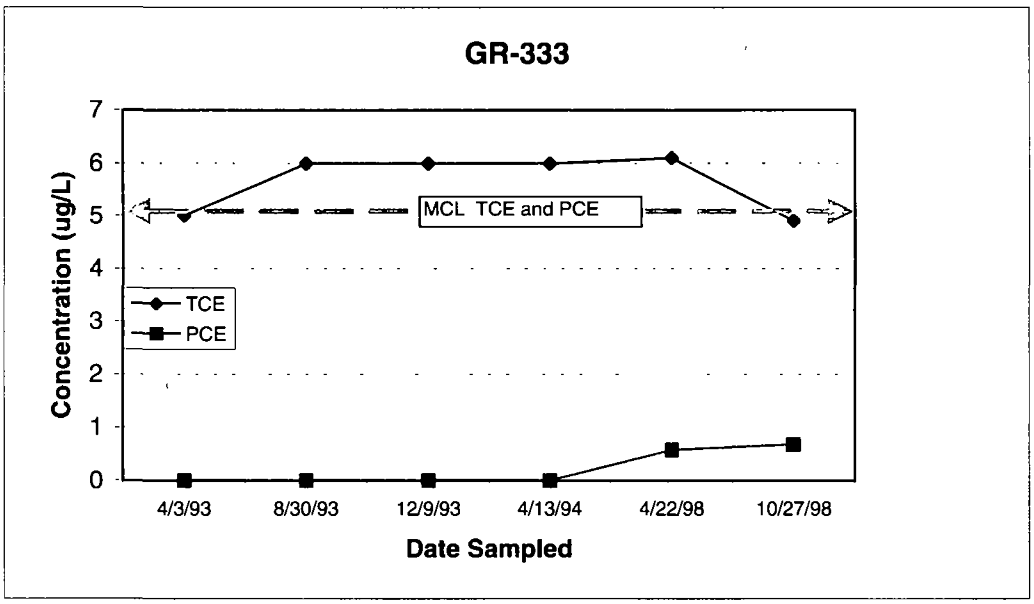


common1/plamondo/Ltm/Figures/Rnd1_graphs xls/OU10(c)

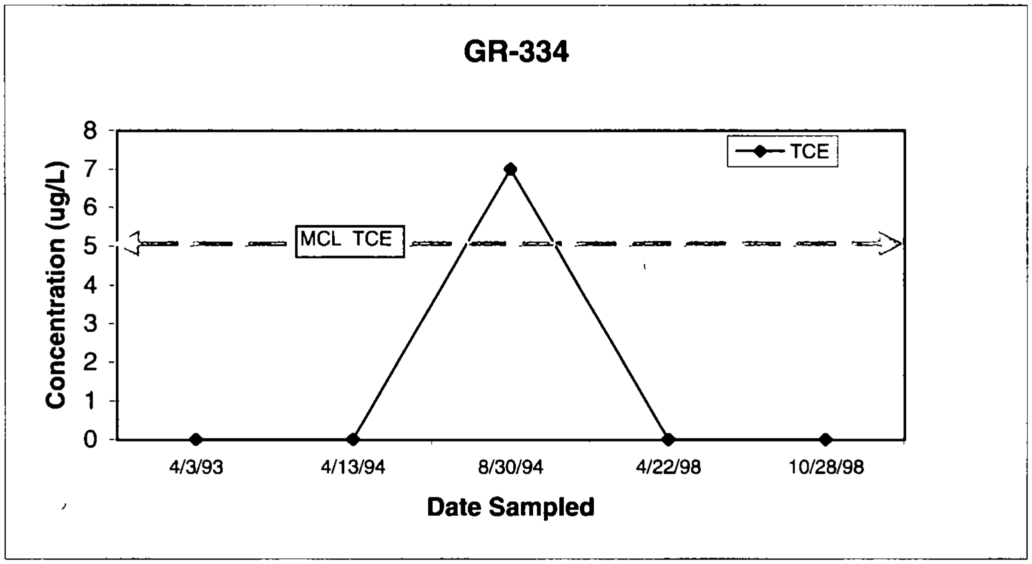
FIGURE 6-29

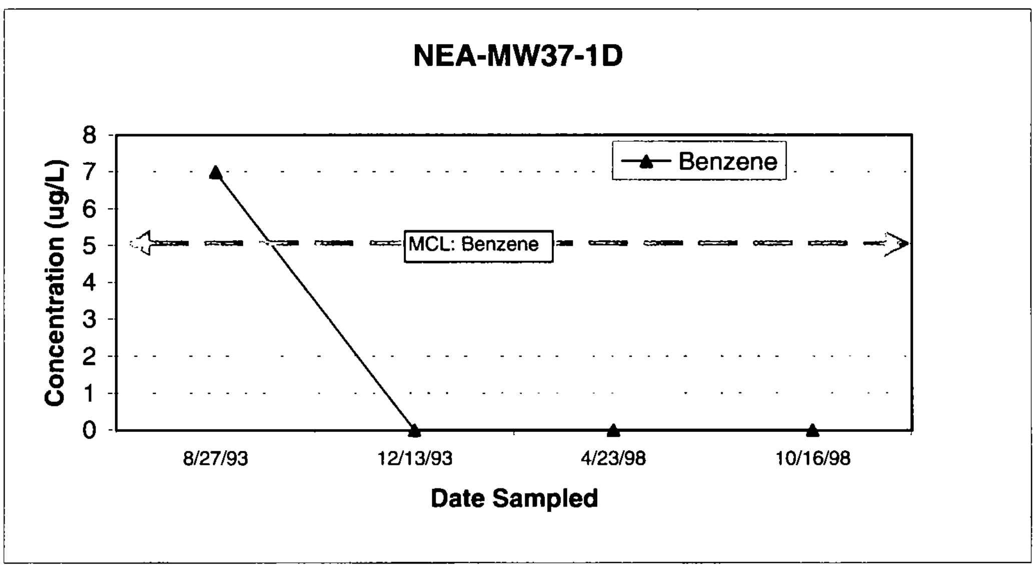
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program





common1/plamondo/Ltm/Figures/Rnd1_graphs xls/OU10(e)

FIGURE 6-31

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program

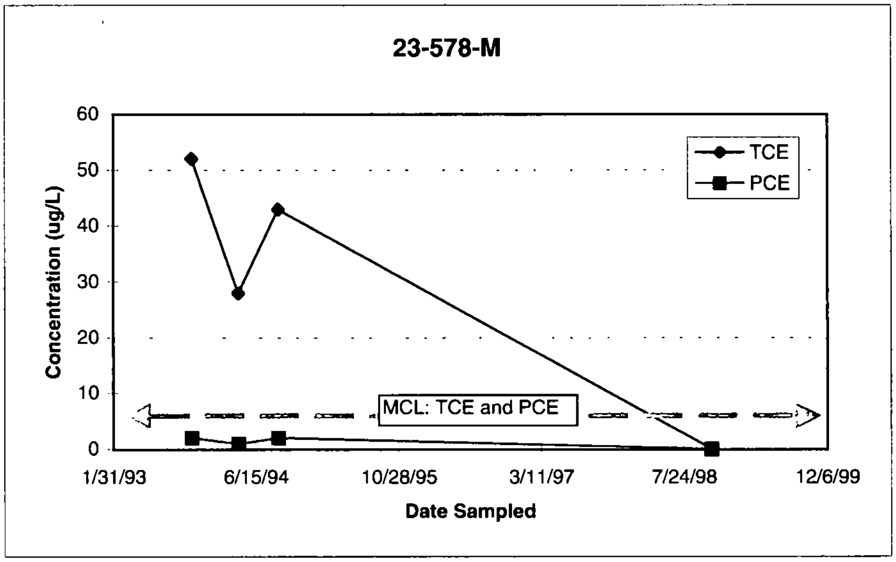
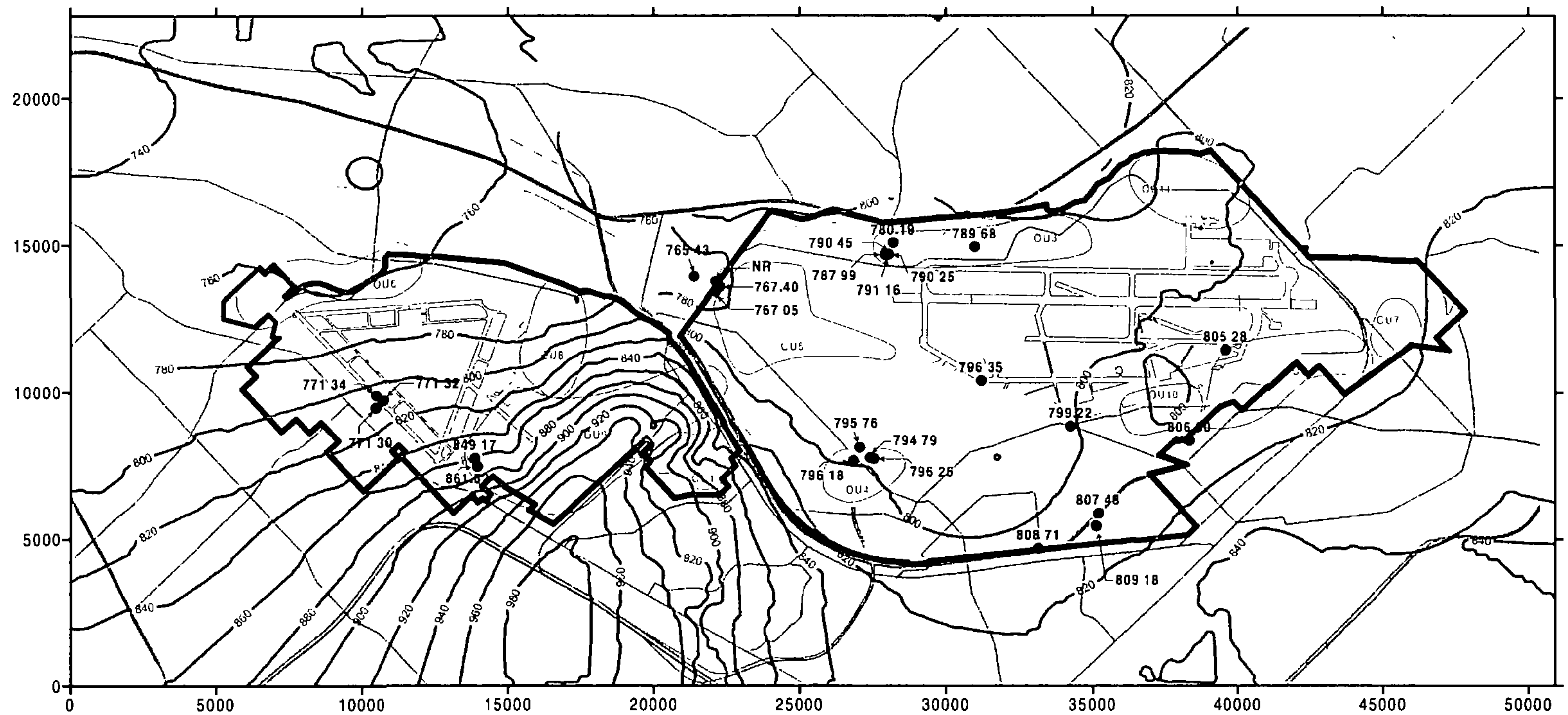


FIGURE 6-32



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Potentiometric Surface Contours from BMP using July 1995 data
- Water Level from October 1998 LTM (in feet)

SCALE

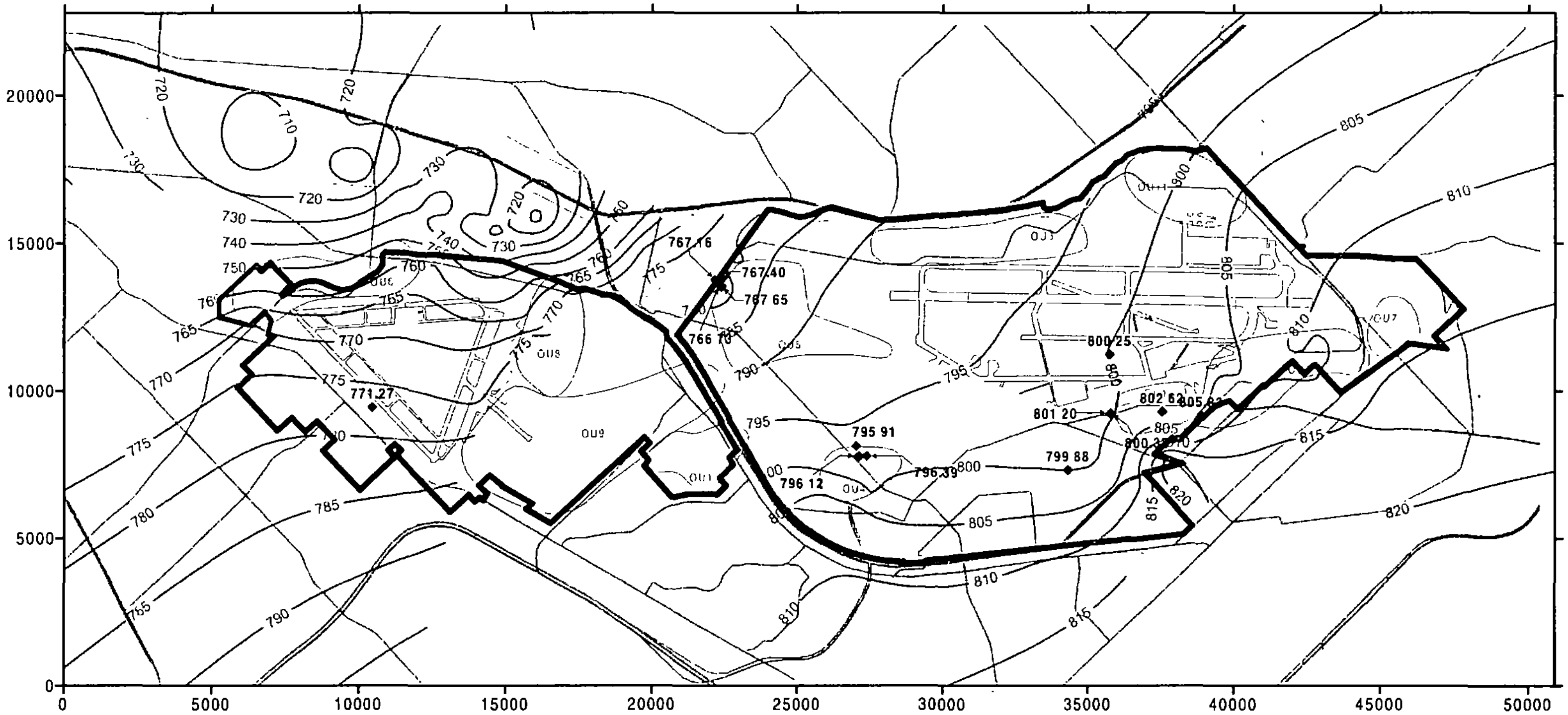
0 2000 4000 6000 8000

(ft)

IT CORPORATION
11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4 000 ft	SHEET NO
DRAWN JMM	CHECKED
P/N	
DATE 02/22/99	
C&C NO	

Figure 7-1
Groundwater Head Map
LTM
Fall of 1998
Layer 1



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Potentiometric Surface Contours from BMP using July 1995 data
- ◆ Water Level from October 1998 LTM (in feet)

SCALE

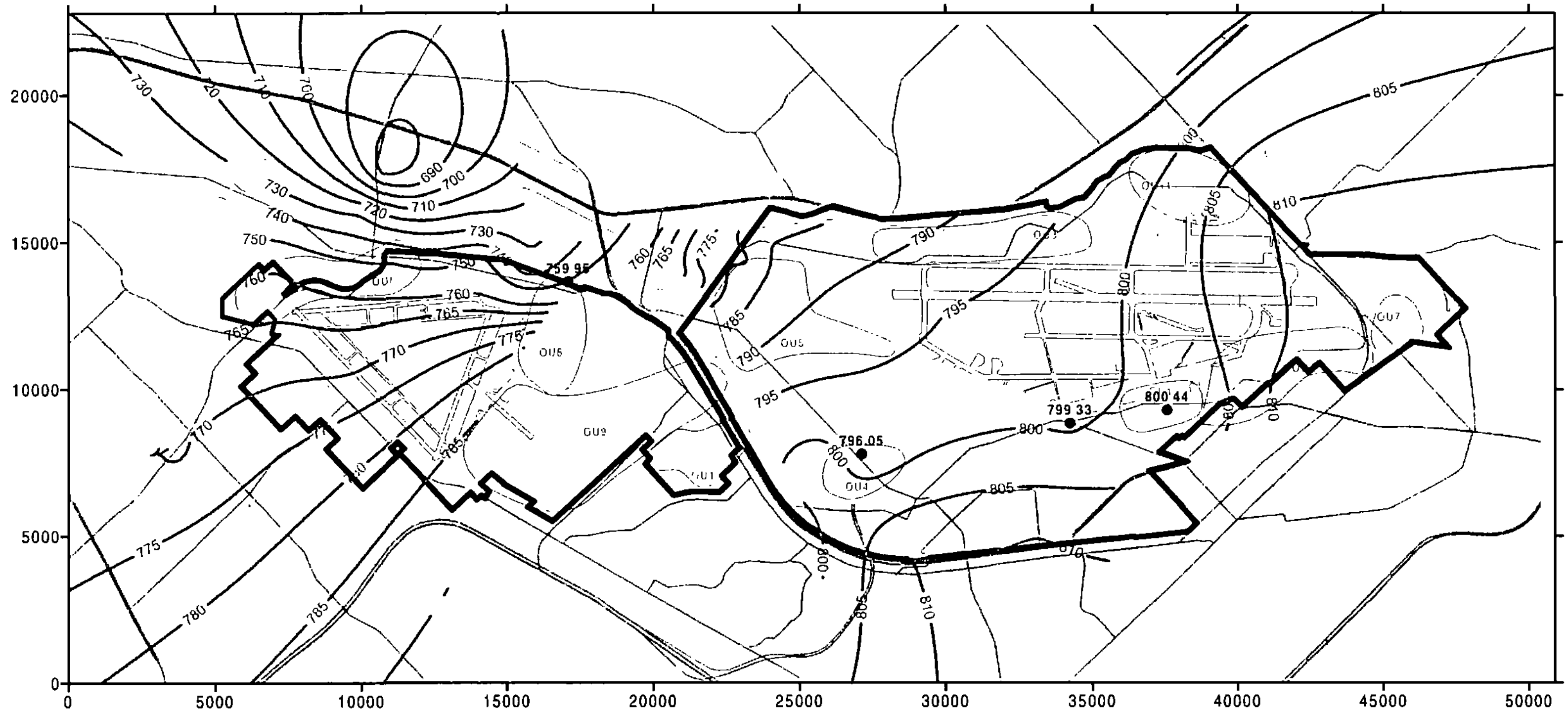
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER RD-D
CINCINNATI OHIO 45246

SCALE 1" = 4,000 ft	SHEET NO
DRAWN JMM / CHECKED	**Figure 7-2 Groundwater Head Map LTM Fall of 1998 Layer 2**
P/N	
DATE 02/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Poteliomteric Surface Contours from BMP using July 1995 data
- ● Water Level from October 1998 LTM (in feet)

SCALE

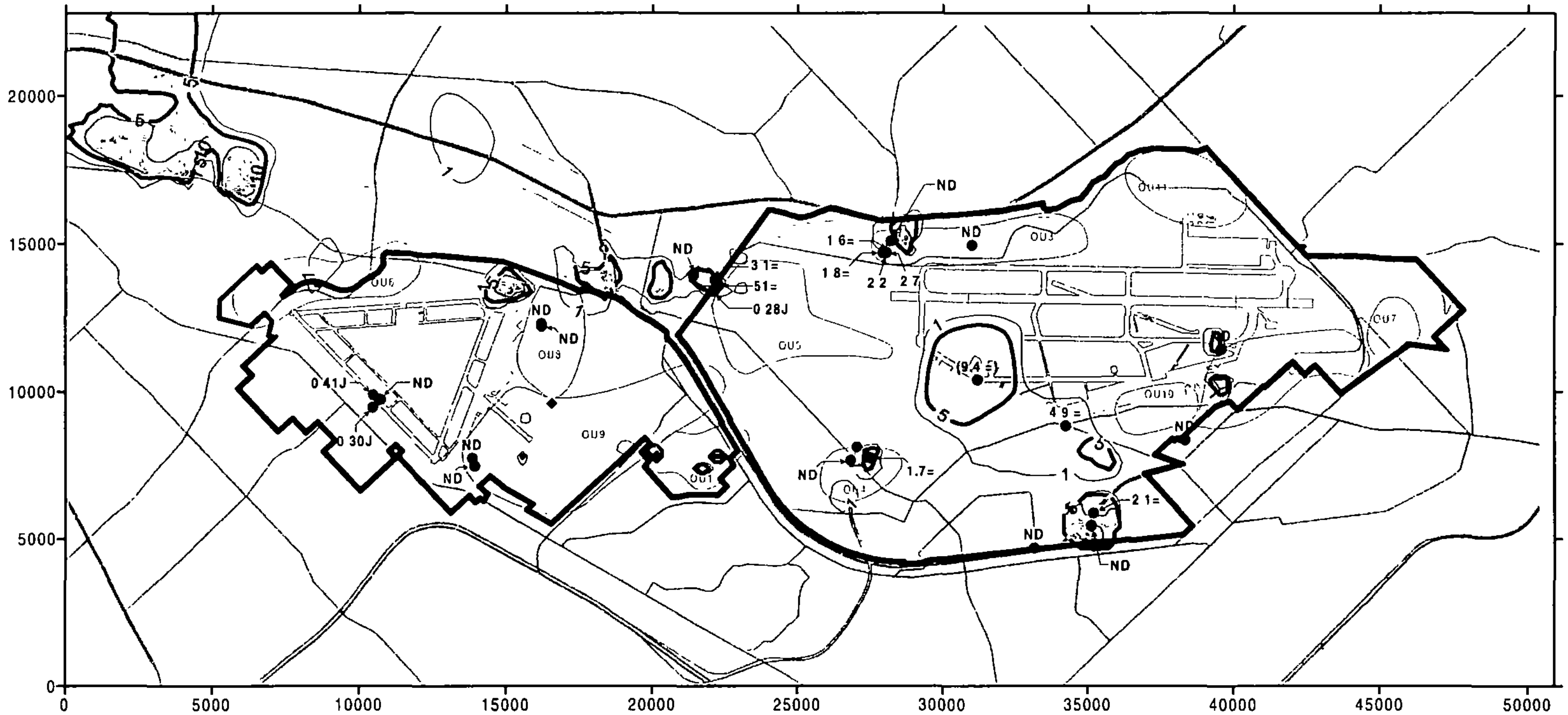
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	**Figure 7-3**
P/M:	**Groundwater Head Map**
DATE: 03/22/99	**LTM**
DWG NO:	**Fall of 1998**
	Layer 3



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

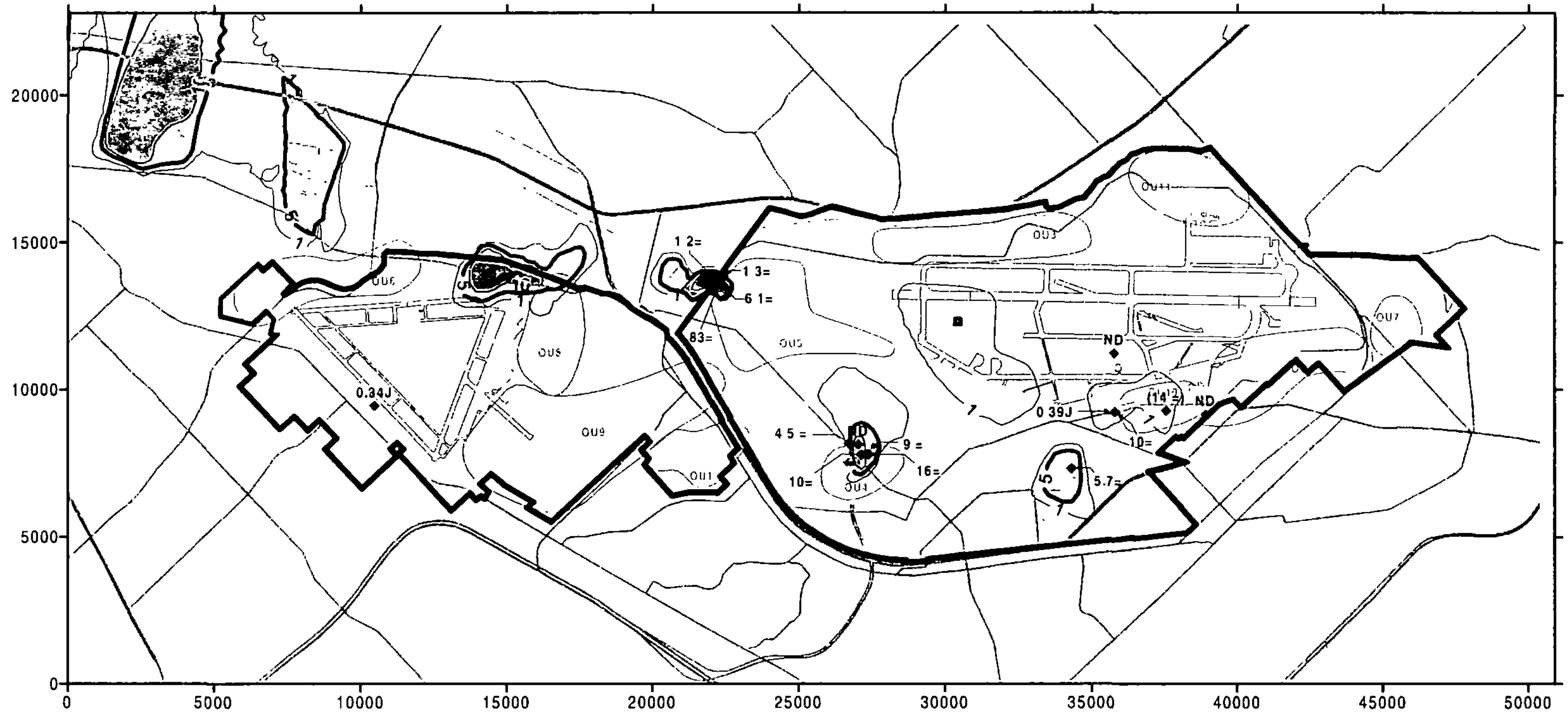
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1 = 4000 ft	SHEET NO
DRAWN IMM / CHECKED	**Figure 7-4**
P/N	**TCE in Layer 1 LTM Fall of 1998**
DATE 03/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct '98 conc in ug/L)
- ♦ Layer 2 Well (Oct '98 conc in ug/L)
- ▴ Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4,000 ft	SHEET NO
DRAWN JMM / CHECKED	**Figure 7-5**
P/N	**TCE in Layer 2 LTM Fall of 1998**
DATE 01/22/99	
DWG NO	

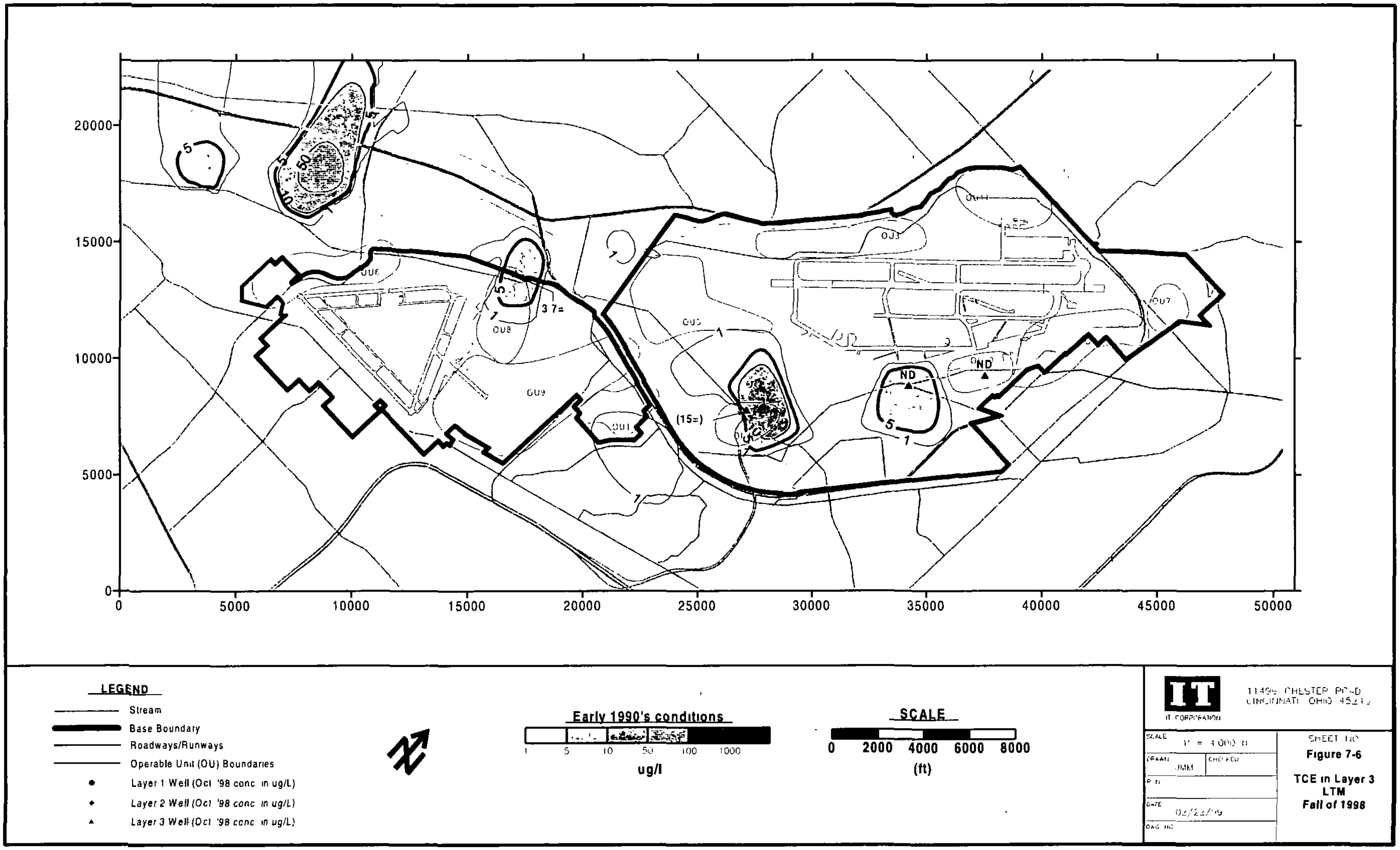
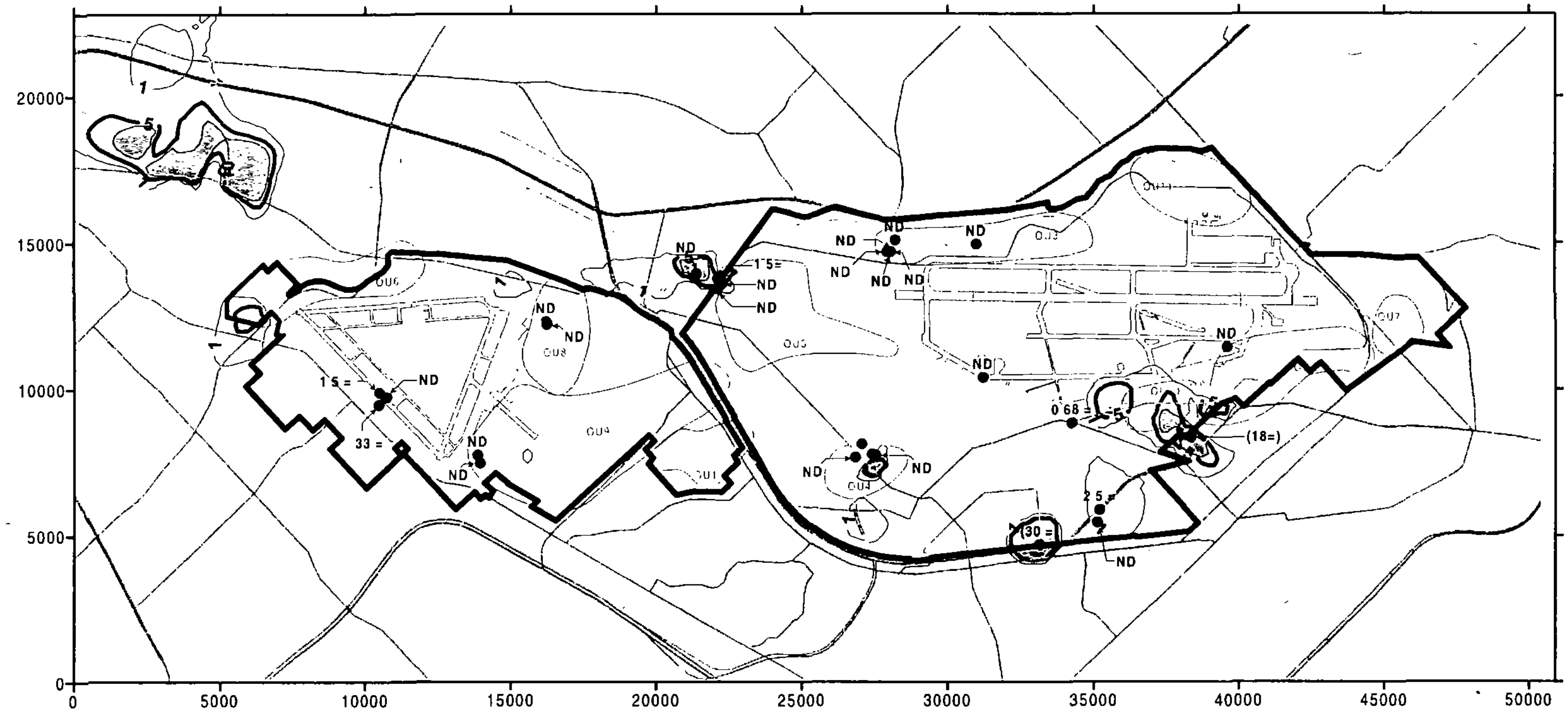


Figure 7-6

TCE in Layer 3 LTM Fall of 1998



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct '98 conc in ug/L)
- ◆ Layer 2 Well (Oct '98 conc in ug/L)
- ▲ Layer 3 Well (Oct '98 conc in ug/L)

Note Burial Sites 5 and 6 wells were installed in June 1997

Early 1990's conditions

1 5 10 50 100 1000

ug/l

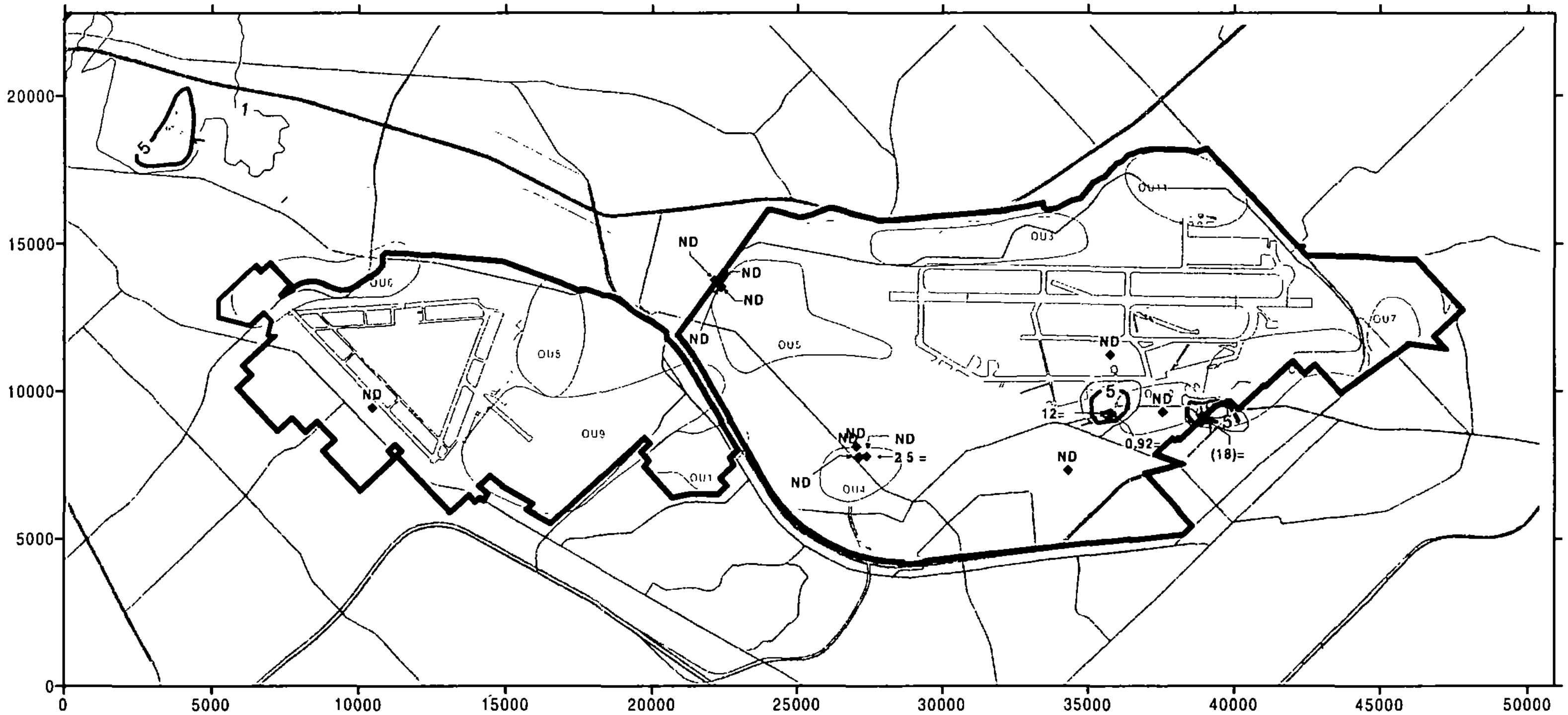
SCALE

0 2000 4000 6000 8000

(ft)

IT CORPORATION
11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4000 ft	SHEET NO
DRAWN MM / CHECKED	**Figure 7-7**
P. N	**PCE in Layer 1 LTM Fall of 1998**
DATE 04/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct '98 conc in ug/L)
- ◆ Layer 2 Well (Oct '98 conc in ug/L)
- ▲ Layer 3 Well (Oct '98 conc in ug/L)

Note Burial Sites 5 and 6 wells were installed in June 1997

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

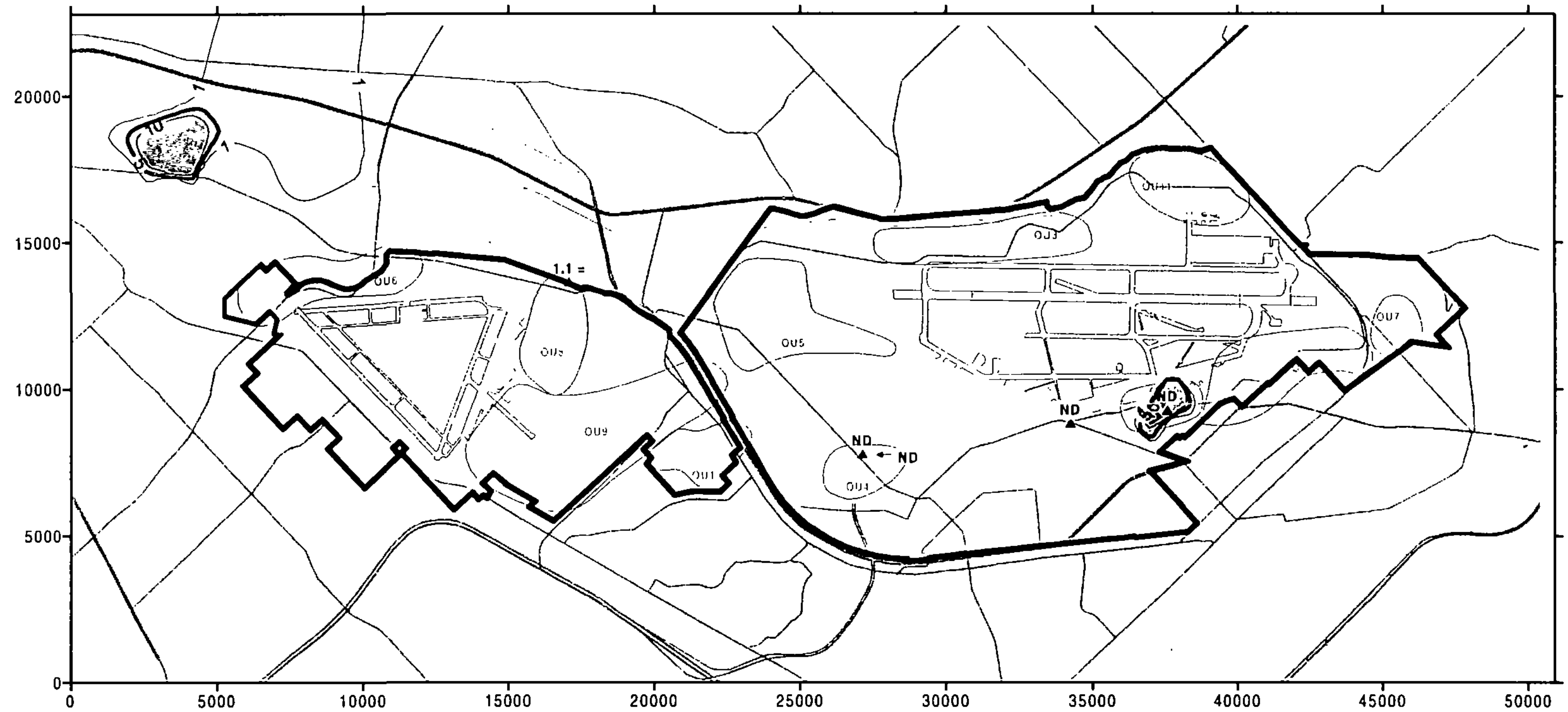
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4,000 ft	SHEET NO
DRAWN JMM / CHECKED	Figure 7-8
P/N	PCE in Layer 2 LTM Fall of 1998
DATE 02/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

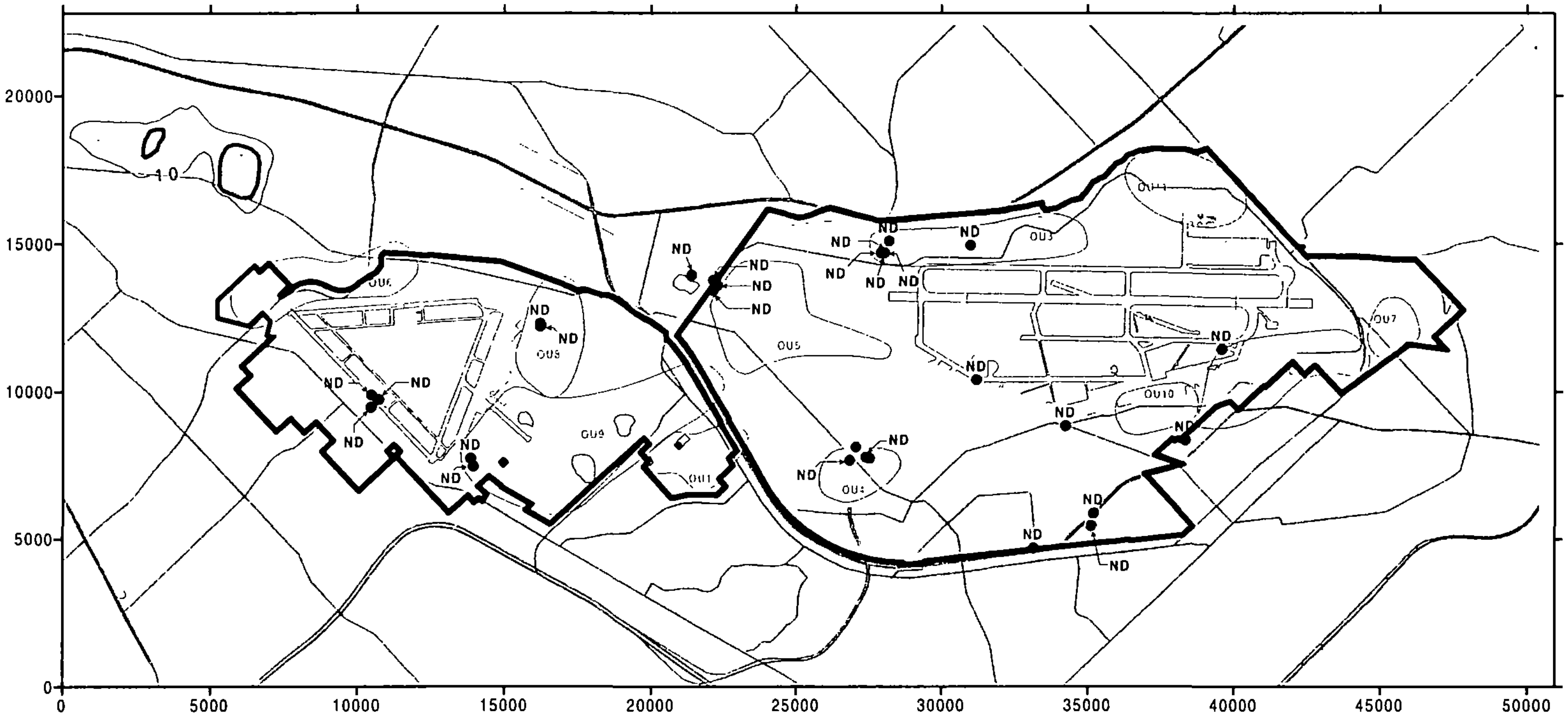
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4,000 ft	SHEET NO
DRAWN MM / CHECKED	Figure 7-9
P/N	PCE in Layer 3 LTM Fall of 1998
DATE 02/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- • Layer 1 Well (Oct '98 conc in ug/L)
- ◆ Layer 2 Well (Oct '98 conc in ug/L)
- ▲ Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

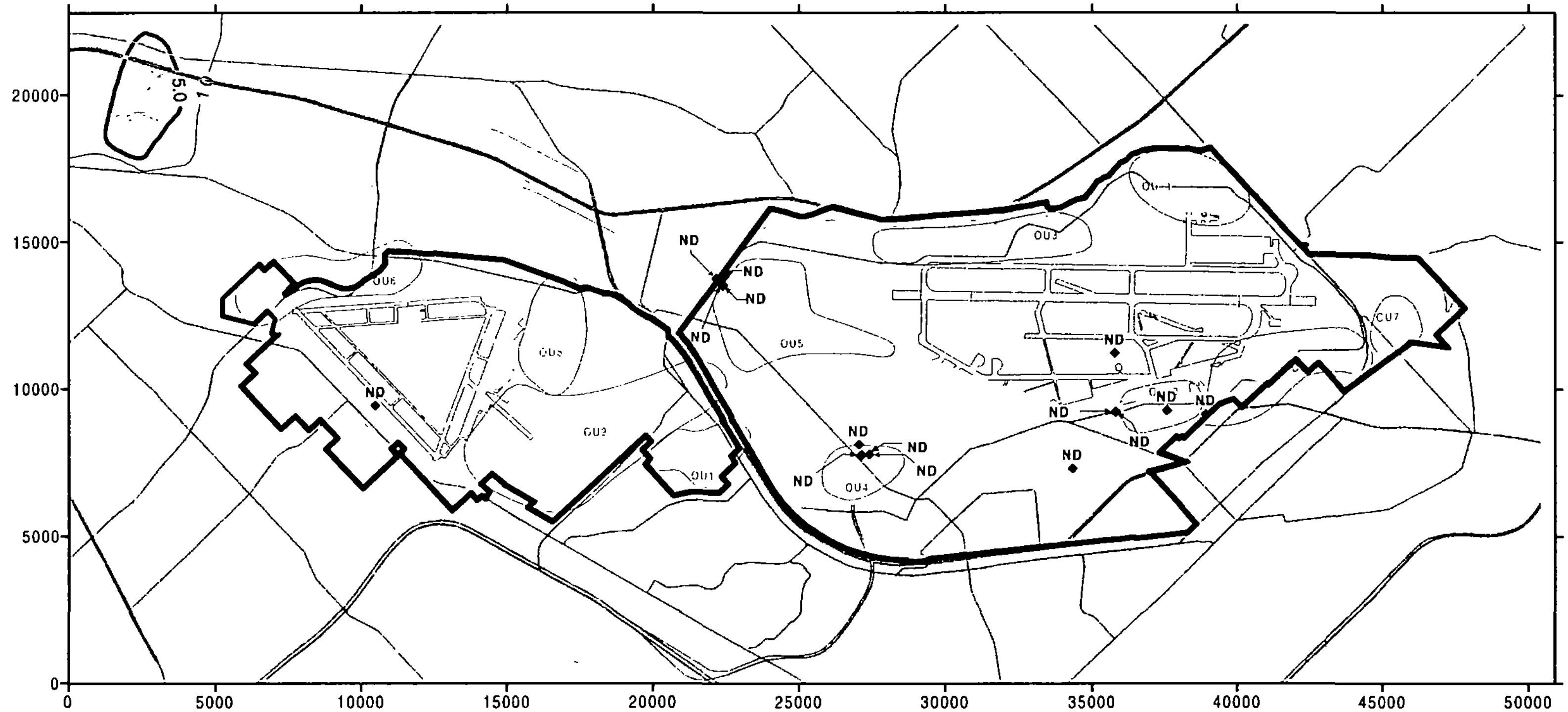
0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4,000 ft	SHEET NO
DRAWN JMM / CHECKED	Figure 7-10 1,2-DCA in Layer 1 LTM Fall of 1998
P/N	
DATE 02/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

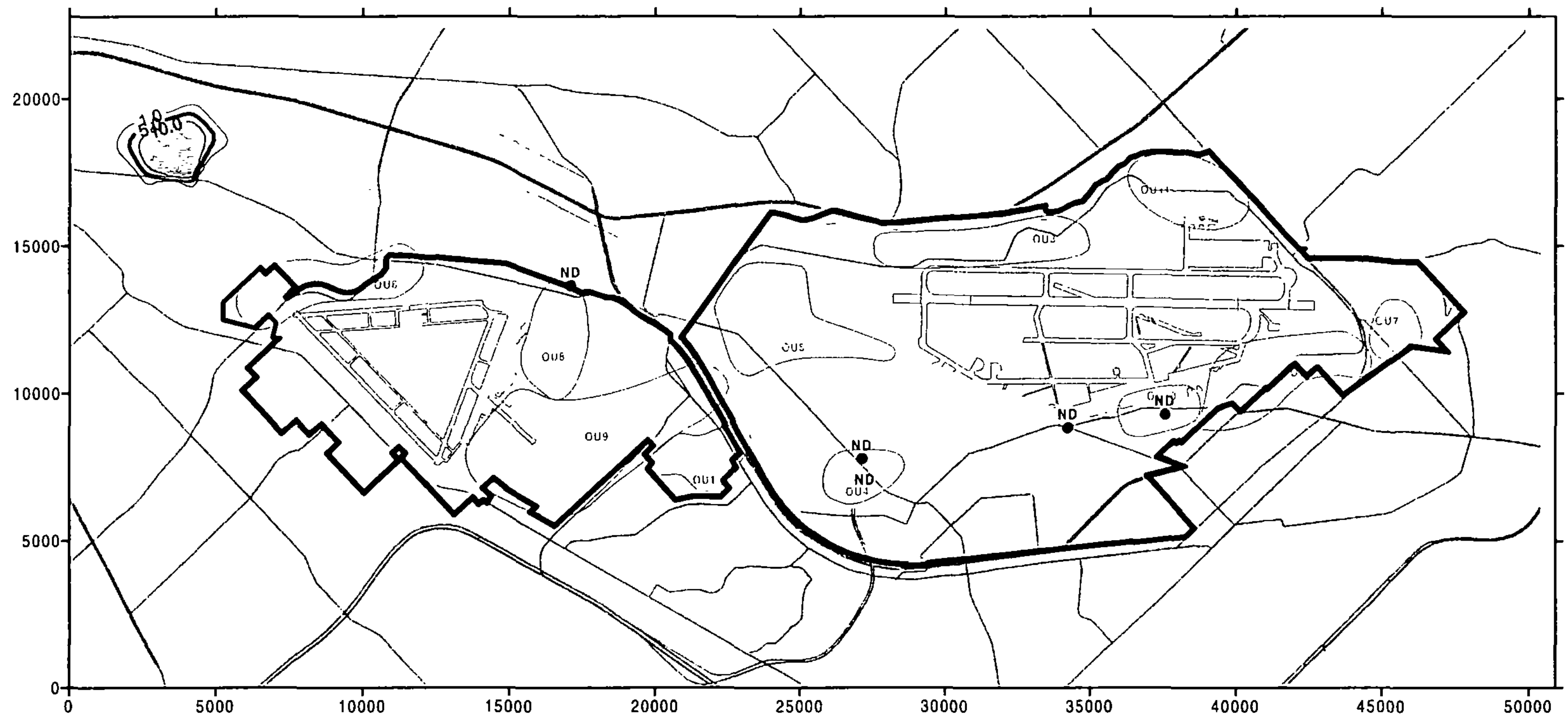
SCALE

0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION
11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1 = 4,000 ft	SHEET NO
DRAWN IMM / CHECKED	**Figure 7-11 1,2-DCA in Layer 2 LTM Fall of 1998**
P/N	
DATE 03/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

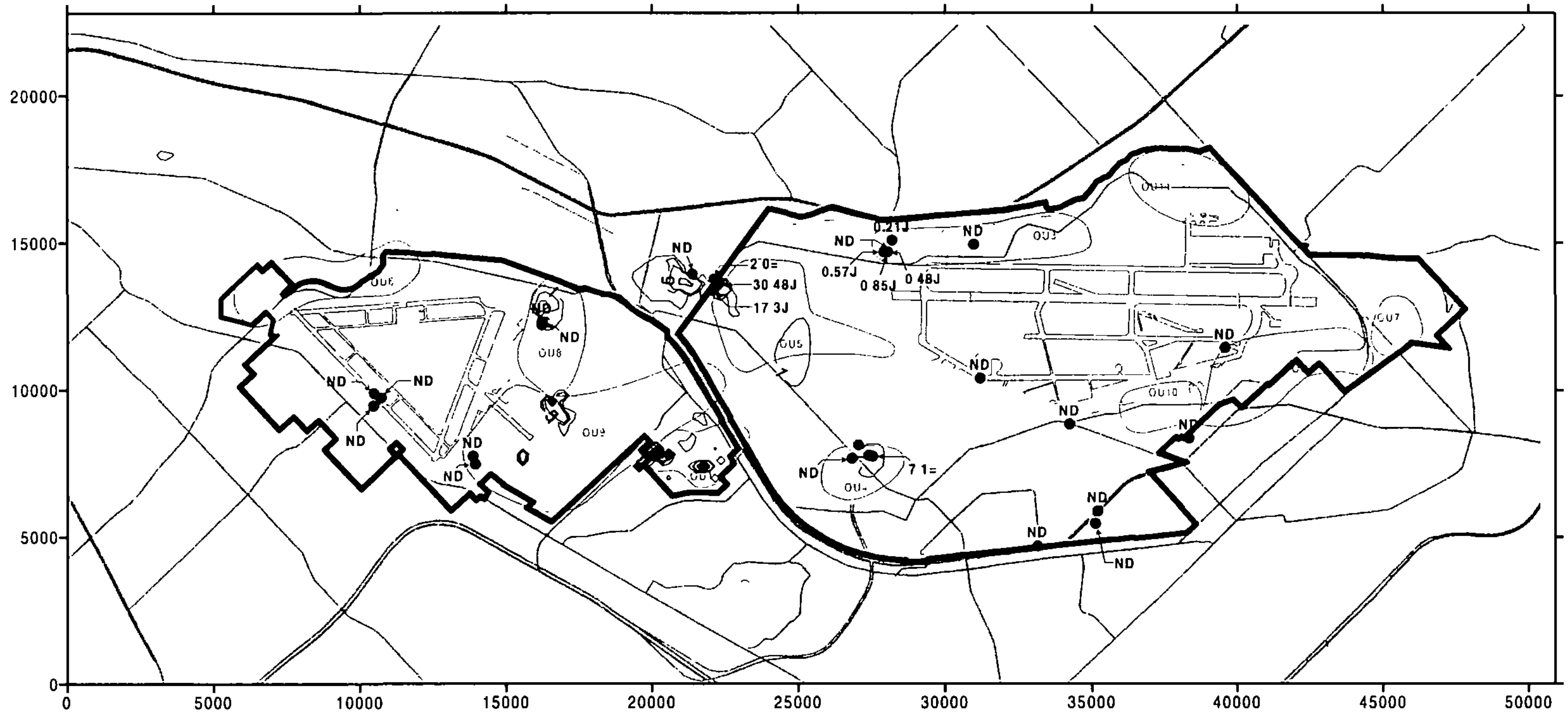
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER RD-D
CINCINNATI OHIO 45246

SCALE 1" = 4,000 ft	SHEET NO
DRAWN JMM / CHECKED	**Figure 7-12 1,2-DCA in Layer 3 LTM Fall of 1998**
P/N	
DATE 02/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct '98 conc in ug/L)
- ◆ Layer 2 Well (Oct '98 conc in ug/L)
- ▲ Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 70 100

ug/l

SCALE

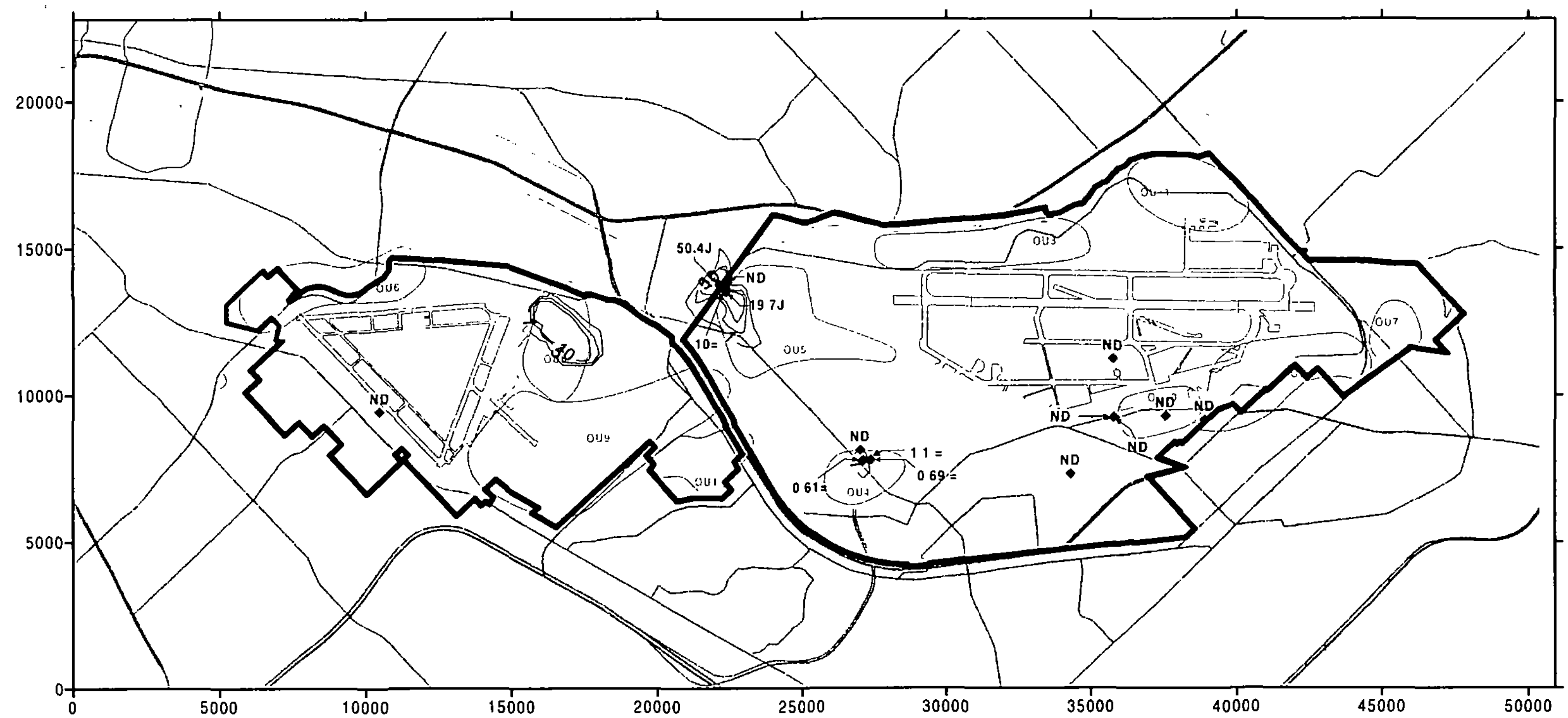
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4 000 ft	SHEET NO —
DRAWN JMH / CHECKED	**Figure 7-13** **1,2-DCE in Layer 1 LTM Fall of 1998**
P/N	
DATE 02/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct '98 conc in ug/L)
- ◆ Layer 2 Well (Oct '98 conc in ug/L)
- ▲ Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 70 100

ug/l

SCALE

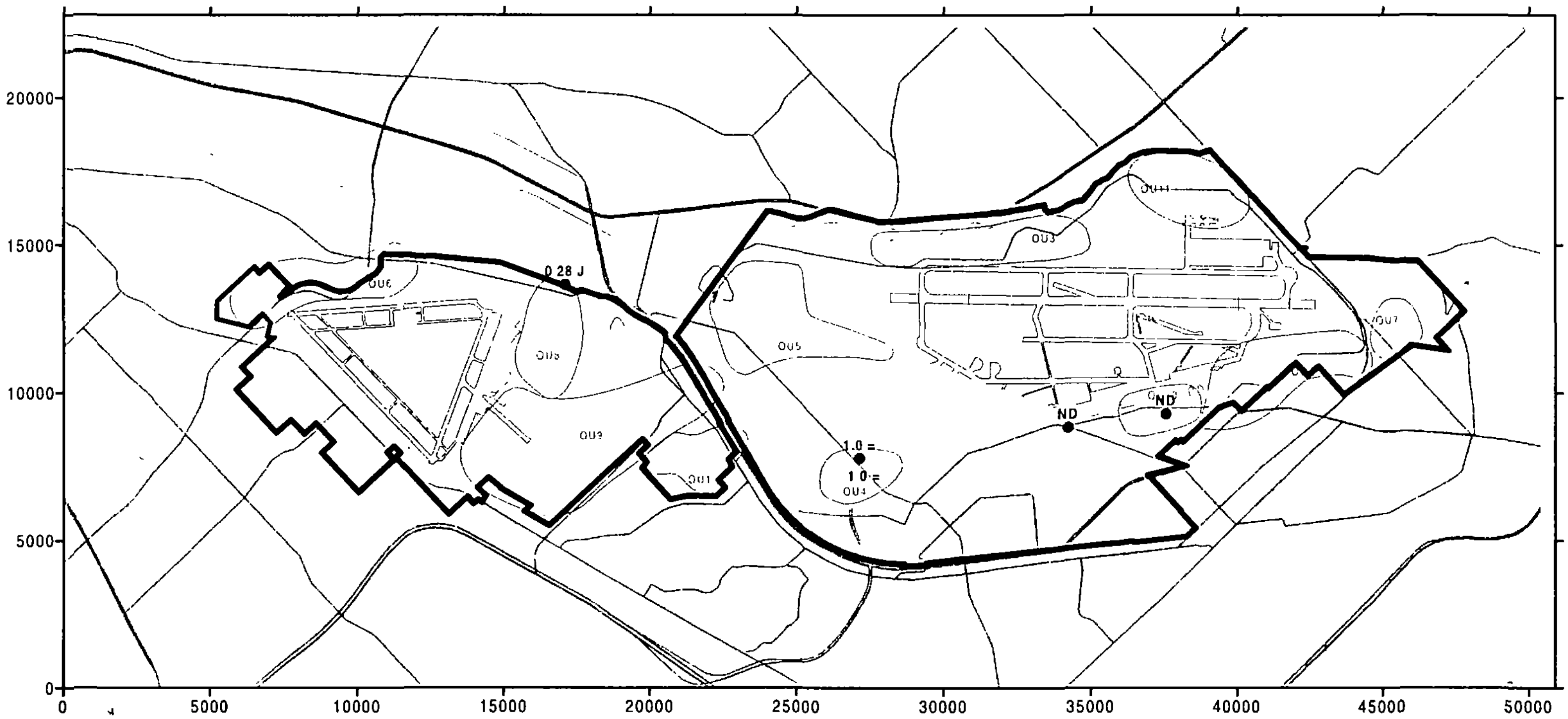
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4 000 ft		SHEET NO
DRAWN JMM	CHECKED	**Figure 7-14** **1,2-DCE in** **Layer 2** **LTM** **Fall of 1998**
P/N		
DATE 03/22/99		
DWG NO		



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1	5	10	50	70	100

ug/l

SCALE

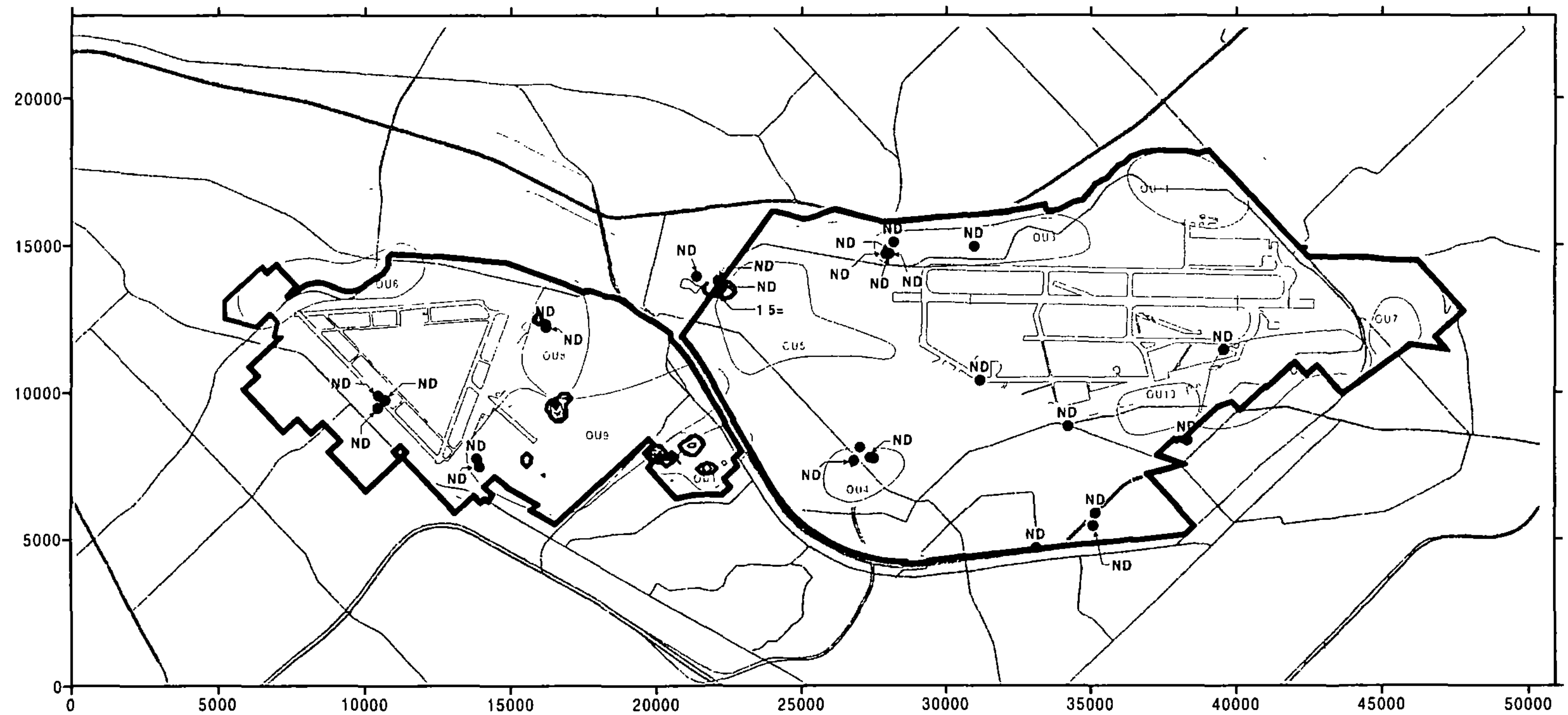
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1 = 4 000 ft	SHEET NO
DRAWN JMM / CHECKED	**Figure 7-15**
P/N	**1,2-DCE In Layer 3**
DATE 02/22/99	**LTM**
DWG NO	**Fall of 1998**



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 2 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

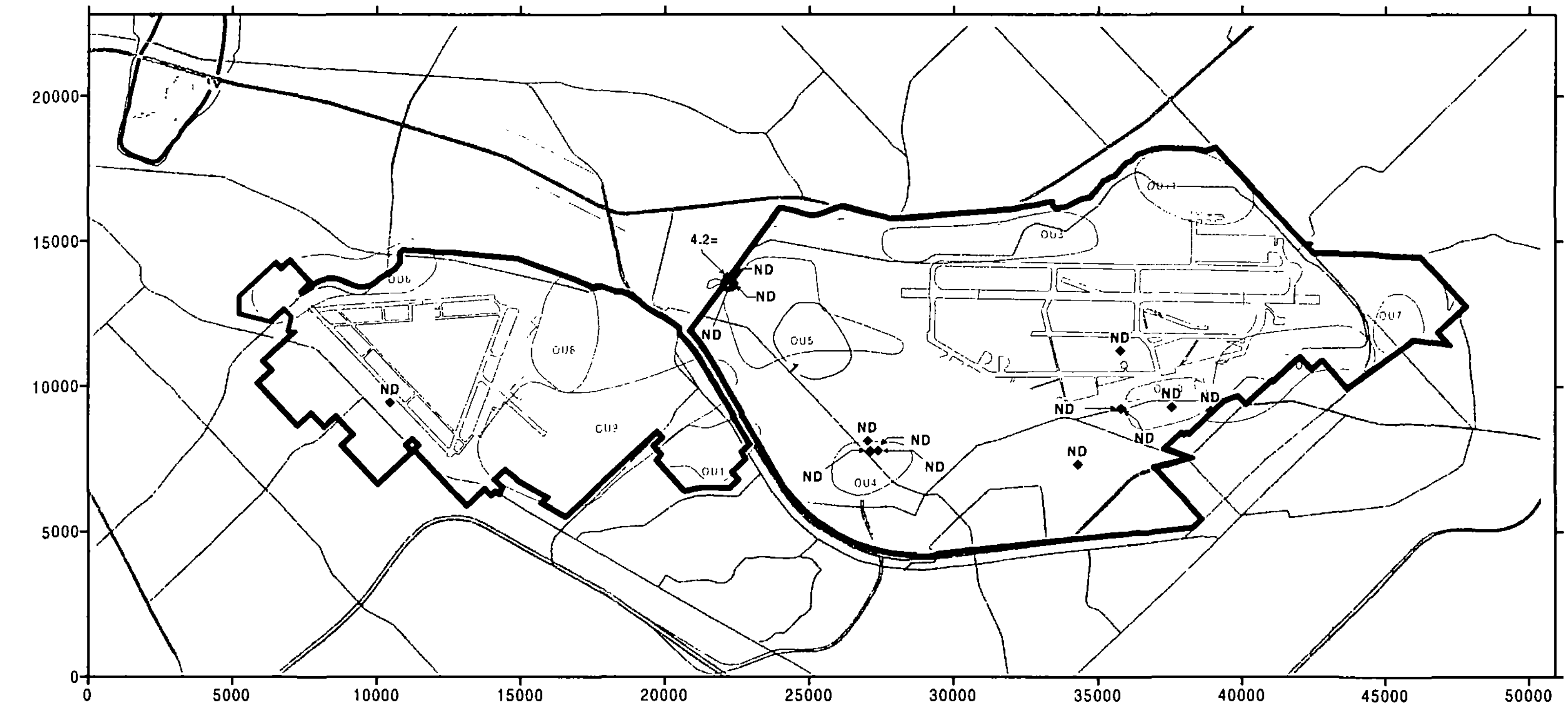
(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4,000 ft	SHEET NO
DRAWN JMM	CHECKED
P/N	
DATE 02/24/99	
DWG NO	

Figure 7-16
Vinyl Chloride in
Layer 1
LTM
Fall of 1998



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 2 10 50 100 1000

ug/l

SCALE

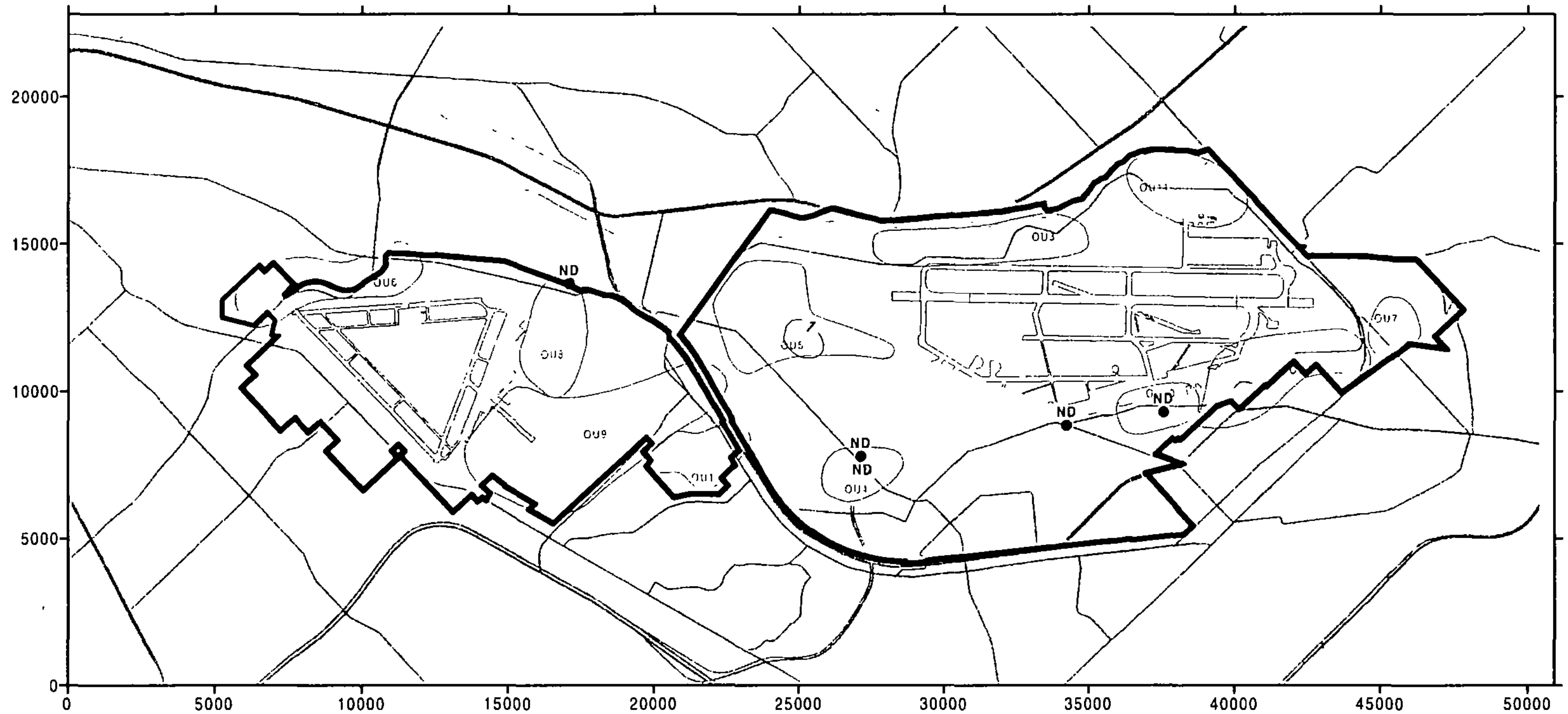
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4000 ft	SHEET NO
DRAWN JMM / CHECKED	**Figure 7-17 Vinyl Chloride in Layer 2 LTM Fall of 1998**
P/N	
DATE 02/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 2 10 50 100 1000

ug/l

SCALE

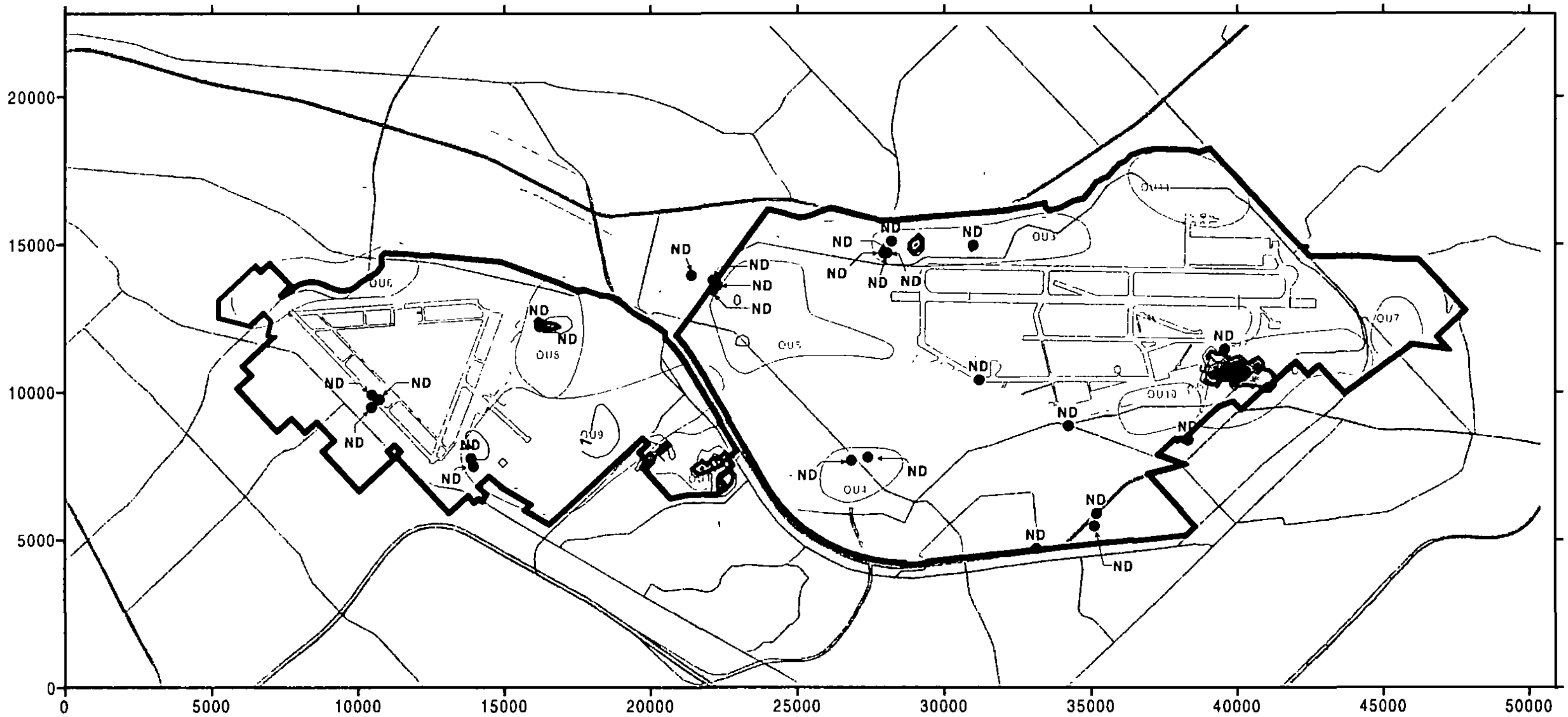
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4000 ft	SHEET NO
DRAWN JMM / CHECKED	**Figure 7-18**
P/N	**Vinyl Chloride in Layer 3**
DATE 02/22/99	**LTM**
DWG NO	**Fall of 1998**



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct '98 conc in ug/L)
- ◆ Layer 2 Well (Oct '98 conc in ug/L)
- ▲ Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

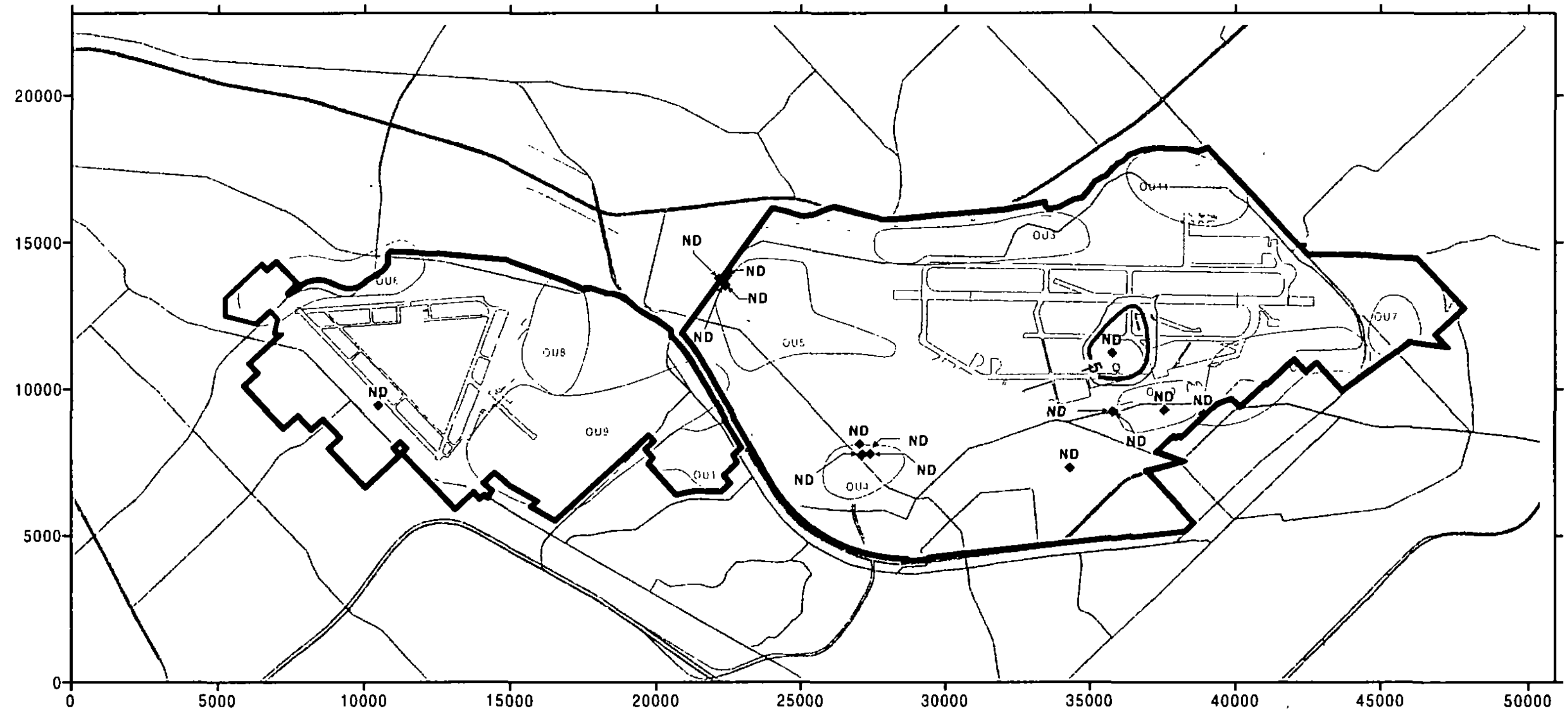
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4,000 ft	SHEET NO
DRAWN JMM / CHECKED	**Figure 7-19**
P/N	**Benzene in Layer 1 LTM Fall of 1998**
DATE 03/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

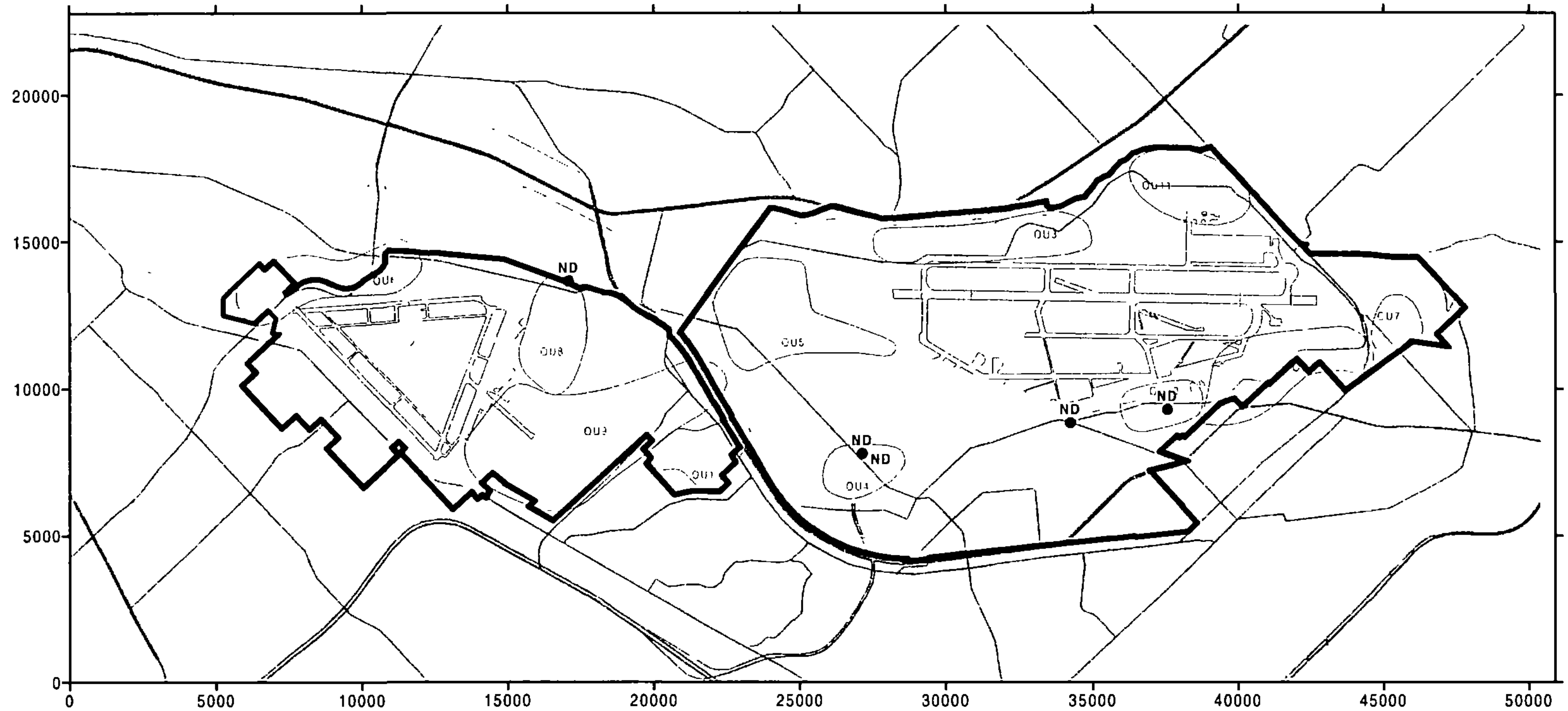
(ft)

IT

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4000 ft	SHEET NO
DRAWN JMM / CHECKED	Figure 7-20
P/N	Benzene in Layer 2 LTM Fall of 1998
DATE 02/22/99	
DWG NO	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct '98 conc in ug/L)
- Layer 2 Well (Oct '98 conc in ug/L)
- Layer 3 Well (Oct '98 conc in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

(ft)

IT

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI OHIO 45246

SCALE 1" = 4,000 ft	SHEET NO
DRAWN JMM / CHECKED	**Figure 7-21**
P/N	**Bezene in Layer 3 LTM Fall of 1998**
DATE 02/22/99	
DWG NO	

using both monitoring well and extraction well data. Not all monitoring well water level data were used in the contouring procedure; only monitoring wells with screened intervals at the approximate elevation of the bottom of the extraction wells were contoured. The location of the measuring points used for generating the water level contours are shown in Figure 2-13.

The regional groundwater flow is from west to east, but is altered by the presence of extraction wells that create local cones of depression. The exception is the extraction well EW-0810 which appears to operate properly but does not lower the water level in the well appreciably. Figure 2-14 shows water level contours generated using only monitoring well data. Figures 2-15 and 2-16 show the capture zones of extraction wells on LF8. The arrows in Figure 2-15 represent groundwater velocity vectors. The velocity vectors passing under the landfill area are captured by the extraction wells along the eastern edge of the landfill. The length of an arrow represents a relative groundwater velocity magnitude. Figure 2-16 illustrates the potential contaminant migration paths across LF8 using particle tracking. The only well that is not capturing the groundwater flow is the extraction well EW-0810 in the central portion of the landfill. Methods to improve the effectiveness of EW-0810 and other extraction wells are being evaluated.

Landfill 10

Landfill 10 represents a local hydrologic high where groundwater from outside the landfill does not contribute substantially to leachate generation. The objective of the extraction system at LF10 is to maintain groundwater levels below the elevation of the bottom of the landfill in order to prevent water from mixing with the waste at the landfill. Controlling the groundwater level will then control the leachate at LF10.

The effectiveness of the Landfill 10 extraction system is evaluated by comparing the elevation of the water table to the elevation of the landfill bottom. The system is achieving the stated goal as long as the water table is below the landfill bottom, and thus any verification of the radius of influence for the extraction wells is not necessary. The extraction wells serve the purpose of lowering the water table rather than creating a uniform capture zone under Landfill 10. The effect of including or excluding the water level data from the extraction wells is even more pronounced at LF10 than at LF8. Figures 2-17 and 2-18 show water level elevation contours generated with and without extraction well water levels, respectively. While the regional groundwater flow is north-northeast, it is interesting to note that some local water table mounds exist at extraction well locations (Figure 2-17). For example, well EW-1003 in the southern portion of LF10 has the highest groundwater level in this area.

To examine the effectiveness of each extraction well, historic water level elevations and the landfill bottom elevation at each well were plotted together (Figures 2-19 through 2-28). Landfill bottom elevations were determined from extraction well installation notes and the drilling reference point elevations. The graphs show that the fluctuations in water levels from one sampling event to another can be more than 20 feet. For example, in October 1996 the extraction well EW-1025 had an unusual low water level, compared to its historic data (Figure 2-28). The opposite is true for the well EW-1011 (Figure 2-22) which had 40 feet higher water level in October 1998 than in the last five rounds of sampling. Potential causes for this and other anomalies include measurement inconsistencies. However, the graphs also indicate that the October 1998 water levels are within their historic range. Since the installation of the landfill caps and the installation of the extraction system, the groundwater levels have generally been decreasing.

Figures 2-19 through 2-28 show that the majority of extraction well water levels are below the bottom of the landfill. However, in wells EW-1003 (Figure 2-20) and EW-1016 (Figure 2-24), the water levels are not below the bottom of the landfill. At these wells the hydrographs indicate that the pumps may not be working properly. These issues are currently being evaluated. Figure 2-29 is a cross-sectional profile along the long axis of LF10 which illustrates the variable landfill bottom and water level elevations throughout the landfill.

In conclusion, based on the groundwater levels, it appears that the OU1 extraction system is continuing to provide a capture zone for LF8 and at most LF10 well locations, to maintain water levels below the landfill bottom.

3.0 OU5 Hydraulic Containment Monitoring

Chapter 3 presents the results of the hydraulic containment monitoring for OU5 at Wright-Patterson Air Force Base, Ohio.

3.1 Introduction

The hydraulic containment monitoring at OU5 was conducted in accordance with the OU5 System Performance Monitoring Plan (IT, 1992). The containment monitoring program consists of monthly monitoring of water levels from 25 monitoring wells and one extraction well at OU5. The objective of monitoring groundwater levels is to evaluate effectiveness of the groundwater extraction system in containing contaminated groundwater in the vicinity of the site (i.e, maintaining a capture zone to eliminate migration of leachate beyond the Base boundaries).

3.2 Site Location and Description

OU5, in the southwest corner of Area C (Figure 3-1), is a collection of discrete sites that have, or may have, been used for handling or disposal of hazardous chemical materials in the past, and areas located adjacent to these sites. Discrete sites include Landfill 5 (LF5) and the Landfill 5 Extension, Fire Training Area 1 (FTA1), the Gravel Lake Tanks Site (GLTS), and Burial Site 4 (BS4). Other areas included in OU5 are the area south of LF5 to Hebble Creek, the area west of the WPAFB southwest boundary to Huffman Dam and north to the extension of Trout Creek, and the area north of FTA1 to Hebble Creek.

General refuse from Areas A and C was reportedly disposed of at this landfill from 1945 to 1991. The refuse may have consisted of unknown quantities of oily wastes and solvents and organic and inorganic chemicals. Actual type, quantities, physical state, hazardous constituents, and pollutants disposed of at this site are not known. The landfill area was originally used in the 1940s as a lumber reclamation area where scrap lumber was sold to the public (Engineering-Science, 1990b). After the 1940s, the area was used as a surface waste disposal operation for disposal of general residential refuse. During the 1940s through 1991, LF5 was used as a coal ash disposal area for wastes from the Base heating plants. LF5 was also the site of waste oil collection, separation, burning, and recycling operations for an approximate 15-to-20 year period of time ending in 1978. The northwestern portion of LF5 was also used for explosive ordnance disposal (EOD) and EOD ash disposal for an unspecified period of time (Weston, 1985).

The location of FTA1 was determined from aerial photographs taken between 1953 and 1962, which show a large circular area of approximately 3 acres containing three individual burn pits. FTA1 was in operation from 1950 to 1955 and is currently used as a civil engineering training site for airfield repair exercises (Engineering-Science, 1990b). During its operation, fuels were burned and extinguished in pits surrounded by earthen dikes after first saturating the ground with water to reduce infiltration (Engineering-Science, 1982). The typical fuels used for fire training exercises included, but may not have been limited to, oily wastes, hydrocarbon solvents, and leaded gasoline. Halogenated solvents may have been present as contaminants in the materials burned.

BS4 is located in Area C along a narrow, wooded stretch of Marl Road. The site is approximately 2,000 feet long and 30 to 40 feet wide. It was originally identified from a July 1945 map. Indications of past backfilling activities have been noted at the site. The period of use or types of wastes disposed of at BS4 are not known. Approximately 10 to 15 scattered drums that were visible on the ground surface throughout the site area were removed as part of a drum removal action in 1990. The drums were composited with others from around the Base and specific records as to the contents of the BS4 drums were not maintained (IT, 1995).

The GLTS is located at the southeast corner of Gravel Lake. The site occupies an area of approximately 150 feet by 100 feet and was reported to contain a torque sludge burning vat and four tanks from the 1940s. Details of the facilities and operation of the GLTS are not known. The site is currently wooded with heavy brush (IT, 1995).

3.3 Site Background Information

LF5 and FTA1 were two of the sites initially identified under the IRP and have been the subject of several phases of investigation based on findings of groundwater contamination near LF5 and findings of minor soil contamination at FTA1. BS4 and the GLTS were identified later in the IRP as "new sites" and have had Site Investigations (SIs) completed. Decision Documents were prepared at the end of the SIs, recommending long-term monitoring for BS4 and the GLTS. Burial

Site 4 and the GLTS were included as part of the OU5 RI primarily to accomplish the long-term monitoring recommended at completion of the SIs. A description of the investigations conducted at OU5 are described in the *IRP Remedial Investigation Report Operable Unit 5 WPAFB, Ohio* (WPAFB, 1995). A brief summary of these investigations is presented below:

- *Phase I Records Search.* This document identifies LF5, the LF5 Extension, and FTA1 as potentially contaminated sites and included them in the IRP (Engineering-Science, 1982).

- *Phase II, Stage 1 IRP Confirmation/Quantification.* Activities during this phase of investigation at OU5 included drilling of soil borings and installation of monitoring wells. Activities were conducted during 1982 through 1984 (Weston, 1985).

- *Phase II, Stage 2 Investigations.* These investigations were undertaken to more fully determine the types of contaminants present and potential exposure pathways. Phase II, Stage 2 resulted in ranking of sites in priority order as type I, II, or III. Phase II, Stage 2 work was initiated in 1986 and completed in 1989 (Weston, 1989).

- *Soil Gas and Geophysical Investigations.* A soil gas survey was performed at LF5, FTA1, and several other IRP sites between Autumn 1989 and Summer 1990 to screen for locations of potential contaminant sources (Engineering-Science (1992c, d). During the same period, a geophysical investigation of LF5 was conducted, also to identify potential sources of contamination within LF5. Results of the geophysical investigation are presented by Engineering-Science (1990c, 1991).

- *City of Dayton Wellhead Protection Program.* Monitoring wells were installed in and around the Rohrer's Island Wellfield as part of the City of Dayton Wellhead Protection Program. Some of these locations are important to definition of contaminants within OU5. These wells were installed in 1986 (Geraghty & Miller, 1987). Subsequently, the City of Dayton expanded the wellhead protection monitoring system in the summer of 1990 by installing six additional monitoring locations within the MCD property. In the Summer of 1992, the City of Dayton again expanded the wellhead protection monitoring system by installing six additional monitoring locations within the MCD preserve.

- *Off-site Migration Project.* In the Autumn of 1990, a limited site characterization was initiated to define contaminants at the southwest boundary of Area C (IT, 1992a). Five monitoring locations were installed along the boundary of Area C. This site characterization led to installation of an extraction well located adjacent to LF5 at the southwest boundary of Area C in 1991. Quarterly sampling of over 20 monitoring wells was initiated in 1991.

- *New Sites SI.* A SI of the GLTS and BS4 was conducted during 1991 (SAIC, 1993).

- *Remedial Investigation and Basewide Monitoring Program.* WPAFB completed the investigation of contaminant distribution within OU5 during 1993 with the RI field activities and by the creation of several sampling locations in association with the Basewide Monitoring Program (BMP) (IT, 1995).

Results of these investigations indicated that groundwater, surface water, sediment, and soil at OU5 are contaminated with organics and metals. Beginning in September 1989, a removal action was undertaken at LF5 with the objective to prevent the off-site migration of contaminated groundwater across the southwest boundary of Area C. A control mechanism consisting of a groundwater extraction and water treatment system was designed, constructed, and became operational in December 1991. Because LF5 was the suspected source of contaminants in groundwater, an investigation (Point Source Removal Action) was initiated to determine if a point source of VOCs was present within the landfill and to perform an EE/CA to mitigate such a source. A source of VOCs was not identified, and the focus of the project was shifted to comply with landfill closure regulations to close the IRP site. A Presumptive Remedy of closure by capping was selected under the USEPA's Superfund Accelerated Cleanup Model (IT, 1995). LF5 was capped in the spring of 1996. Subsequent to the implementation of source control measures at LF5, a ROD was prepared and accepted for No Further Action at this site. In addition to the source control measures, a groundwater extraction system was installed to prevent further migration of contaminated groundwater beyond the Base boundary.

As part of the EE/CA (IT, 1999) removal action objectives were identified and removal action alternatives were evaluated for OU5 (FAA-A). Of the four alternatives evaluated, Alternative A4, in-situ treatment via chemical oxidation in the vicinity of EW-1, has the potential to significantly reduce the time necessary to achieve the remedial action objectives. Currently, a Treatability Study including a chemical oxidation pilot-test at EW-1 is being considered.

As indicated in Section 3.1, the results of the groundwater level monitoring at OU5 will be used to evaluate the effectiveness of the leachate extraction system in containing leachate and groundwater in the vicinity of the site. The hydraulic containment monitoring procedures and results conducted under the LTM for OU5 are presented in the sections below. Long-term groundwater monitoring for OU5 is being conducted under the GWOU LTM program and is described in Chapter 6.

3.4 Water Level Monitoring

The objective of measuring groundwater levels at OU5 is to evaluate the impact of the extraction system on the water levels in the vicinity of the site. During the October 15, 1998 water level monitoring, the OU5 groundwater treatment system was not operational. To develop a groundwater contour map representative of pumping conditions at OU5, water level elevations from the December 1998 monthly monitoring were used. The December data includes the dynamic water level elevation of EW-1 which is critical to creating the capture zone. Figure 3-2 shows the locations and water level elevations of the 25 monitoring wells and EW-1 that were monitored on December 9, 1998. Hydraulic head in a monitoring well was computed by subtracting the measured depth to water from the reference elevation for the well (Table 3-1). Out of 25 wells, one well was dry (08-528-M) during the December 9, 1998 sampling.

Groundwater contours were generated for the observed hydraulic head using SURFER, a contouring package (Golden Software, Inc., Golden, Colorado). The area represented in Figure 3-3 is 2,300 feet long and 2,200 feet wide. The contours were generated by first overlying the area by a 231 by 221 grid. The value of the hydraulic head at a grid node was computed from the 22 measured values by using linear kriging, an interpolation option in SURFER.

Accuracy of a water level map depends not only on the number of measured values but also on the distribution of the measuring points (monitoring wells). Figure 3-2 reveals that most of the wells used in monitoring groundwater levels at OU5 are located in a narrow north-south zone on the west side of the Landfill 5. In addition to being concentrated within the narrow zone, the monitoring wells are also clustered. Thus in effect the number of points used in the contouring procedure were reduced. In spite of the poor distribution of the data, the water levels look reasonable considering the historic water levels and the regional groundwater flow direction. The contours in Figure 3-3 indicate that there is a cone of depression caused by pumping of the extraction well EW-1.

3.5 Groundwater Capture Zone Analysis

The main purpose of the extraction well EW-1 is to maintain a capture zone to prevent migration of contaminated groundwater from the Landfill 5 area. The main mechanism of contaminant transport is advection, i.e., a process by which moving groundwater carries dissolved solutes. Thus the understanding the groundwater flow pattern is the first step in an analysis of contaminant transport. In an isotropic aquifer, the flow lines are perpendicular to the equipotential lines (groundwater contours).

During the October 1998 water level monitoring at OU5, the groundwater treatment system and extraction well EW-1 were shutdown for maintenance. The groundwater levels measured on October 15, 1998 are, therefore, not representative of normal pumping conditions and the zone of capture created by EW-1. Figure 3-3 presents the groundwater elevation contours for December, 1998 and indicates that groundwater flow across the eastern portion of Landfill 5 is in the southwest direction. At the western boundary of Landfill 5, groundwater flow direction is altered by EW-1 where a capture zone is created.

The water level map constructed from the measured values was imported into Visual MODFLOW, a widely used groundwater simulation package (Waterloo Hydrogeologic, Inc., Waterloo, Ontario). The model area was discretized into 2310 columns and 220 rows, with a uniform spacing of 10 feet.

The groundwater velocity vectors and particle tracking generated by Visual MODFLOW are illustrated in Figure 3-4 and 3-5, respectively. In addition to the "isotropic" assumption, the aquifer is also assumed to be homogeneous within the model area. The length of a velocity vector is proportional to the actual groundwater velocity. The influence of the extraction well EW-1 on the regional flow can be evaluated by examining the flow pattern in the vicinity to the landfill. The relatively long velocity vectors (Figure 3-4) and particle tracks (Figure 3-5) within the landfill area indicate that the well is "pulling" water beneath the landfill and as a consequence, the water level contours upgradient from the extraction well are closely spaced. Downgradient from the well a stagnation zone is created and the velocity vectors are relatively short. The water level contours in the portion of the aquifer are also widely spaced.

The capture zone of extraction well EW-1 can be outlined by examining the flow directions of the particle tracks. Most groundwater particles under the landfill area are being "captured" by EW-1. However, the particles along the eastern edge of the landfill appear to be outside the EW-1 capture zone. This could simply be a result of the lack of data in this portion of the aquifer. Figure 3-3 shows that the water levels in the southeastern quadrant of the model area are contoured based on a single monitoring well (08-022-M).

In conclusion, based on the groundwater levels and the analysis of the distribution of groundwater velocity, it appears that the extraction well EW-1 is continuing to provide a hydrodynamic barrier to any migration of contaminated groundwater from the Landfill 5 area. The most uncertainty regarding the capture of any potential contaminants originated at the landfill is along the eastern and the southern edge of the landfill. To improve the spatial distribution of groundwater monitoring points in the vicinity of LF5, it is recommended that the following wells (with screened intervals indicated), be included in the monthly monitoring program: CW09-073 (63 - 73 ft), CW12-085 (75 - 85 ft), CW15-055 (45 - 55 ft), CW21-018 (8.5 - 18.5 ft), CW21-040 (30 - 40 ft), MW131M (58.3 - 68.3 ft), MW132S (22.3 - 32.3 ft), and MW133S (43.4 - 53.2 ft). These additional locations will provide a more evenly distributed network of wells to contour the groundwater level elevations.

4.0 Landfill Gas Monitoring at OU4

Chapter 4 presents the results of the landfill gas monitoring at OU4.

4.1 Introduction

Landfill gas monitoring was initiated at OU4 in accordance with the *OU4 Landfill Gas Monitoring Technical Memorandum* (CH2M HILL, 1998) and the *Operation and Maintenance Plan Operable Unit 4 Landfills 3, 4, 6, and 7, and Drum Staging/Disposal Area* (CH2M Hill, 1997). This program includes quarterly monitoring of soil gas at Landfills 3, 4, 6, and 7. The objective of this monitoring program is to evaluate the migration of landfill gas away from the landfills towards nearby structures. Gases may be formed in landfills by microbiological degradation of organic matter and/or by volatilization of organic liquids (e.g., solvents, fuels) creating the potential hazards of explosion and exposure. Data collected as part of this monitoring program is used to evaluate trends in the generation of landfill gas and to determine if a landfill gas collection system at OU4 will be necessary.

4.2 Site Location and Description

Landfills 3, 4, 6, and 7 comprise the fourth of eleven operable units identified at WPAFB. The landfills were active at various times between 1940 and 1962. The landfills are currently covered with grass and topsoil (Landfill 3); grass, topsoil, and clay cover soil (Landfills 6 and 7); and asphalt and pavement (Landfill 4). The landfills are located on the southeastern boundary of Areas A and C (Figure 4-1). Landfill 3 is located east of the intersection of Novick and Hebble Creek Roads. Landfill 4 is located south of Hebble Creek and an unnamed tributary of Hebble Creek parallels the southwest boundary of the landfill on the opposite side of Skeel Avenue. The southern boundary of Landfill 6 is located next to an unnamed tributary that connects with the unnamed tributary flowing between Landfills 4 and 6 that discharges to Hebble Creek. Landfill 7 is located east of two unnamed intermittent tributaries that discharge into Hebble Creek. A drum storage/staging area located northwest of Landfill 7 is also part of OU4. The drums in this area were removed from OU4 in 1990 (CH2M HILL, 1994).

Landfill 3, active from 1940 to 1944, underlies the tenth green of the Military Golf Course and covers about 3 acres. This landfill was used as a surface dump and burn operation; general refuse from Areas A and B were reportedly accepted at the landfill. Landfill 4, which underlies the Civil Engineering equipment storage yard and covers about 8 acres, was active from 1944 to 1949 and accepted general refuse. A water-filled gravel pit in Landfill 4 was reportedly filled with large objects such as automobile bodies. Landfill 6, active from 1949 to 1952, underlies pasture land used by the WPAFB equestrian facility and covers about 7 acres. This landfill was used as a trench and cover operation; a 2 acre water-filled gravel pit covered part of the landfill. Landfill 7, active from 1952 to 1962, also underlies pasture land used by the WPAFB equestrian facility and covers about 18 acres. This landfill was used as a trench and cover operation; general refuse from Areas A and B were accepted at the landfill (CH2M HILL, 1994).

4.3 Site Background Information

Hazardous materials are known to have been landfilled at WPAFB during the active lives of the OU4 landfills and may have been disposed of in the OU4 landfills. However, the types, quantities, physical state, and specific hazardous constituents of wastes disposed of in the four landfills is unknown. To determine whether contamination was present at OU4, several investigations were performed at or near OU4 (CH2M HILL, 1994):

- *Confirmation/Quantification Investigation (Stages 1 and 2):* During these 1985 and 1989 investigations, 17 groundwater monitoring wells were installed within and around the perimeter of OU4. Groundwater, surface water and sediment samples were collected and analyzed. Organic compounds were detected in groundwater samples; metals and one organic contaminant were detected in surface water samples; and organic and metal contaminants were detected in sediment samples. Results are presented in the final *Phase II Stage 1 Report*, Weston, 1985 and the *Stage 2 Technical Report* (Weston, 1989).

- *Skeel Avenue Construction Excavation Sampling:* For the construction of Skeel Avenue connecting Areas A and C with State Route 444, a portion of Landfill 4 was excavated in 1988. Organic and inorganic contaminants were found in soil samples collected during the excavation. Contaminated soil was removed and disposed of at either a sanitary landfill or a hazardous waste landfills. Results of the investigation are presented in the final *Phase II Stage 2 Technical Report* (Weston, 1989).

- *Soil Gas survey for Landfills 3, 4, 6, and 7:* A soil gas survey was conducted at the four landfills between December 1989 and June 1990. Volatile organic compounds and total hydrocarbons were detected in the collected soil samples. Results of the investigation are presented in the *IRP Analysis of Soil Gas Survey Results for Landfills 3, 4, 6, and 7* (Engineering Science, 1992).

- *Geophysical Investigation of Landfills 3, 4, 6, and 7:* Magnetic and electromagnetic conductivity surveys were performed at Landfills 3, 4, 6, and 7 between February and March 1990. Results of the investigation are presented in the *IRP Geophysical Investigation Report for Landfills 3, 4, 5, 6, 7, 8, 10, 11, and 12* (Engineering Science, 1992).

- *Remedial Investigation of OU4:* A remedial investigation of OU4 was conducted between October 1992 and March 1994. Results of the investigation are presented in the *Remedial Investigation Report, Operable Unit 4, Landfills 3, 4, 6, and 7, and Drum Staging/Disposal Area* (CH2M Hill, 1994). Investigations as part of the RI included contaminant source investigations, meteorological investigations, surface water and sediment investigations, geological investigations, soil and vadose zone investigations, groundwater investigations, and an ecological assessment. Volatile organic contaminants were detected in leachate samples; chlorinated VOCs and metals were detected in groundwater samples, and organics and metals were detected in soil, surface water and sediment samples. The conclusions of the RI were that contaminants detected onsite were considered to be related to OU4 activities (e.g., landfill operations, drum disposal).

As documented in the *Basewide Removal Action Plan for Landfill Capping* (IT, 1994), source control measures planned at LFs 3 and 4 consist of implementing routine operation and maintenance for landfill gas monitoring and cover maintenance. Source control measures planned at LFs 6 and 7 consist of improvements to the existing soil cover to eliminate ponding and improve surface runoff, implementation of routine operation and maintenance for landfill gas monitoring, and cover maintenance.

In accordance with the OU4 Landfill Gas Monitoring Technical Memorandum (CH2M HILL, 1998) and the OU4 Operations and Maintenance Plan (CH2M HILL, 1997), landfill gas monitoring at landfill gas wells at Landfills, 3, 4, 6 and 7 is conducted on a quarterly basis. In addition, landfill gas measurements are collected at select locations within Buildings 877 and 878. Monitoring of landfill gas during 1997 detected methane at one of the wells (LG-10) in the vicinity of these buildings. A description of the gas monitoring procedures and monitoring results are presented in the following sections.

4.4 OU4 Landfill Gas Monitoring Procedures

As part of the quarterly monitoring program, eight landfill gas monitoring wells (LG-1, LG-2, LG-3, LG-6, LG-7, LG-8, LG-9, and LG10) were installed around Landfills, 3, 4, 6 and 7 between June 9 and June 20, 1997 (Figure 4-2). Each landfill gas well consists of a 0.5-inch inside diameter PVC well screen and riser. Monitoring of these wells in October 1998 included measurements of methane, carbon dioxide, and oxygen. The procedures used when monitoring the landfill gas wells were as follows:

- Set-up gas monitoring equipment (GA-90 gas analyzer) per the instruction manual (the equipment was pre-calibrated by HAZCO);
- Attach GA-90 tubing to gas monitoring well valve;
- Purge well;
- Record gas readings on monitoring form;
- Close sample valve, disconnect GA-90 tubing; and
- Secure well.

The results of the sampling are presented below.

4.5 OU4 Landfill Gas Monitoring Results

Monitoring of the eight gas wells was conducted on October 14, 1998. Monitoring in Buildings 877 and 878 was conducted on November 10, 1998. Results of the sampling, including well number, date, time and gas concentration, are presented in Table 4-1. Methane was detected in one well, LG-10, at a concentration of 3.1 percent. Methane is combustible at concentrations in air between 5 percent [the lower explosive limit (LEL)] and 15 percent [the upper explosive limit (UEL)]. Below 5 percent, there is insufficient methane for combustion; above 15 percent, there is insufficient oxygen for combustion. Although detected, the methane in LG-10 is not present in sufficient amounts for combustion.

5.0 Activities at OU4

Two new monitoring wells were installed at the northwest corner of Operable Unit 4 (OU4) to provide delineation of the downgradient edge of the VOC plume at OU4. This chapter discusses the installation of those wells and observations made during the installation.

5.1 Site Location and Description

OU4 consists of Landfill 3 (approximately 3 acres), Landfill 4 (approximately 7 acres), Landfill 7 (approximately 18 acres) and the Drum Staging/Disposal Area (DDA). OU4 is located along the southern boundary of Area C and the western-most boundary of Area A, between the intersections of Skeel Avenue and Communications Boulevard and Skeel Avenue and Hebble Creek Road (Figure 4-1).

5.2 Site Background

OU4 was initially investigated in 1981 when Roy F. Weston, Inc. (Weston), performed a Phase I Investigation. Stage 1 and Stage 2 Phase II Site Investigations (SIs) were performed by Weston in 1985 and 1989, respectively. In September 1992, the OU4 RI was conducted by CH2M HILL (HILL, 1994).

Long-term monitoring at OU4 includes the monitoring of eight landfill gas monitoring wells throughout the site and groundwater sampling under the Basewide Long-Term Groundwater Monitoring (LTM) Program.

Investigations of contaminant source areas at OU4 have indicated the presence of chlorinated hydrocarbon groundwater contaminants. It was determined in the Draft-Final Engineering Evaluation/Cost Analysis (EE/CA) for the Basewide Monitoring Program (BMP) at WPAFB (IT, 1998a) that two additional monitoring wells were needed at OU4 to delineate the boundary of the plume in the downgradient direction and to monitor plume migration.

5.3 Objectives

Specific objectives of establishing downgradient monitoring locations were to fill critical data gaps related to risk assessment and contaminant transport analysis. Under the BMP, the two monitoring wells were installed as a well pair in the downgradient direction from OU4 to monitor for the potential migration of the VOC plume (Figure 5-1). The location of the well pair was chosen because it was outside of any known soil or groundwater contamination at OU4. One monitoring well was screened at the bottom of the upper sand and gravel zone (BMP-OU4-MW01B-60), the other well was screened at the top of the lower sand and gravel zone (BMP-OU4-MW01C-84). The purpose of the well cluster is to determine if TCE contamination is infiltrating from the upper sand and gravel zone, through the upper silt/clay (till) zone, into the lower sand and gravel zone.

Sections 5.4 and 5.5 discuss the monitoring well installation field activities and, geology and hydrogeology at OU4, respectively. A discussion on the OU4 landfill gas monitoring and results is presented in Chapter 4.0.

Groundwater sampling of the two new and existing monitoring wells will be conducted semiannually under the Basewide LTM Program. Groundwater analytical results and evaluation for OU4 are presented in the Round 1 Basewide LTM section (Chapter 6.0).

5.4 Monitoring Well Installation Field Activities

Groundwater monitoring well installation procedures are described in the following sections.

5.4.1 Rotasonic Drilling Activities

Rotasonic drilling activities at OU4 were conducted by Bowser-Morner of Dayton, Ohio, concurrently with the Building 59 Site Investigation (SI) drilling activities in Area B of WPAFB. OU4 drilling activities were conducted in accordance with the Building 59 SI Work Plan (IT, 1998b) with the exception of soil sampling. Soil samples from the OU4 monitoring well boreholes were field screened with a photoionization detector (PID) only and were not submitted for off-site laboratory analysis.

A total of two monitoring wells were drilled in the downgradient direction of OU4 (Figure 5-1). Well BMP-OU4-01B-60 was screened in the bottom of the upper sand and gravel unit and had a completion depth of 60 feet below ground surface (bgs). Well BMP-OU4-01C-84 was screened in the top of the lower sand and gravel unit and had a completion depth of 84 feet bgs.

Rotasonic drilling activities began on October 1, 1998 and ended on October 2, 1998. The rotasonic drilling technique used simultaneous high-frequency vibrational and low speed rotational motion to advance the cutting edge of a hollow, circular drill stem. This dual action creates a uniform borehole while providing relatively continuous cores of both unconsolidated and consolidated material. During the drilling process, minimal amounts of drill cuttings, mixed with drilling fluid (potable water), are generated. The potable water drilling fluid was obtained from the Bowser-Morner facility and transported to the Base.

In the rotasonic drilling process, the rotasonic rig pushes a 4-inch internal diameter sample core barrel inside of a 6-inch diameter drive casing. The core barrel is advanced ahead of the drive casing, generally in 5- to 20-foot increments to collect continuous core samples from the undisturbed soils.

After coring of a new interval, the barrel is detached from the drill head and sealed. The drive casing is advanced to just above the leading edge of the core barrel and cuttings are pushed out with potable water and containerized. The core barrel is then retracted from the borehole. At retrieval, the core is extruded from the barrel into a protective plastic sleeve for handling. The extruded core is then screened with an HNu® PID along its entire length (through perforations made in the sleeve). The plastic sleeve is cut open for detailed description.

Soil core lithology is described/recorded on a boring log by the field geologist in accordance with the workplan. PID readings were also recorded on each boring log. Boring logs are presented in Appendix E.

After the lithology and PID readings were recorded, the remaining core was containerized in 55-gallon steel drums. A composite Toxicity Characteristic Leaching Procedure (TCLP) sample was collected from the drummed soils and submitted to Quanterra Analytical Services for analysis. Results of the TCLP analysis indicate that all detected concentrations were below Preliminary Remediation Goals (PRGs) and were nonhazardous. Soils were disposed of by surface spreading at Landfill 12 in Area C.

5.4.2 Monitoring Well Construction

Both well screens were placed to intersect the water table in each aquifer and to allow for seasonal fluctuations in the water table elevation.

All construction materials were decontaminated prior to use following the approved WPAFB field procedure (FP) FP3-2. Both wells were constructed of 2-inch diameter, flush joint threaded, Schedule 40 polyvinylchloride (PVC) riser with a 10 feet length of 0.010 inch slotted PVC well screen. Global #7 filter pack sands were used. Pure Gold™ bentonite pellets were used for the seal and the grout was composed of a mixture of approximately 95 percent cement and 5 percent powdered bentonite.

After advancing the borehole to the desired depth, monitoring wells were installed in accordance with FP5-2. Initially the well riser pipe and screen were assembled and placed in the boring. The sand filter pack was placed around the screen to a height of 3 to 3.5 feet above the top of the screen by pouring the sand into the annular space between the riser pipe and outer Rotasonic casing. Sand depth was periodically checked with a weighted tape measure. Bentonite pellets were then installed on top of the filter pack to create a minimum 2-foot seal prior to placement of the cement-grout mixture. In accordance with the manufacturer's specifications, hydration time of the bentonite seal was not less than 30 minutes following the addition of approximately 5 gallons of potable water. The remaining annulus of the borehole, above the frost line, was completed by filling with a mixture of ASTM type II cement and bentonite grout to the surface for the installation of flush-mounted well vaults.

A 6-inch diameter by 2-foot long, flush-mounted, steel vault casing was placed into the boring and around the top of the casing riser. The remaining annulus was grouted. Well pads consisted of a 1.5-foot diameter circle around the well vault, raised slightly at the center and tapered at the edges.

A well identification tag made of a brass surveyor's pin and stamped with the location name and the well name (i.e., BMP- OU4-01C-60) was embedded in the concrete pad. Monitoring well construction specifications are summarized in Table 5-1. Monitoring well construction logs are presented in Appendix E. Figure 5-2 is an illustration of a typically completed flush-mounted monitoring well.

5.4.3 Monitoring Well Development

Monitoring wells were developed in accordance with the FP5-4 to remove fine particles from the drilling process, ensure free flow of formation water into the well, and to remove any remaining water introduced during drilling.

Wells were developed by surging and pumping using a Geoguard pneumatic bladder pump. The water volume removed during development was based on the water volume in the well calculated in accordance with FP5-4.

Well volume calculations were performed according to the following equation:

$$Vc = p\,(di/2)^2(TD-H)$$

$$Vf = p[(dH/2)^2 - (do/2)^2](TD - S \text{ or } H)(P)$$

If S > H use S, if S < H use H

$$Vt = (Vc + Vf)(7.48)$$

Where:

Vc	=	Volume of water in casing, ft^3
Vf	=	Volume of water in filter pack, ft^3
Vt	=	Total volume, gal
di	=	Inside diameter of casing, ft
do	=	Outside diameter of casing, ft
dH	=	diameter of borehole, ft

TD	=	total depth of well, ft
H	=	depth to water from ground surface, ft
S	=	depth to base of seal from ground surface, ft
P	=	estimated porosity of filter pack (estimated at 30 to 35% for filter pack sand)
7.48	=	conversion factor from ft^3 to gallons

The volume of water removed during development was measured by pumping water into a container marked in 0.5-gallon increments.

Temperature, pH, specific conductivity, and turbidity of purged water were monitored during development. Development was determined to be complete when a minimum of three volumes of water had been removed, the physical and chemical parameters had stabilized (pH within +/- 0.1 units, temperature with +/- 0.5 degrees Celsius, and specific conductance with +/- 10 microohms per centimeter), and turbidity was less than 25 NTU. Development details are recorded on well development logs presented in Appendix E.

Wastewater generated from well development was containerized and transferred to the storage tank at OU4 for disposal by a certified treatment and disposal facility.

5.5 Site Geology and Hydrogeology

Geologic and hydrogeologic conditions at OU4 are described in the following sections.

5.5.1 Geology

The elevations across the OU4 area range from about 800 to 830 feet. The bedrock beneath WPAFB consists of gently dipping sedimentary rock of Ordovician and Silurian age (about 400 to 500 million years old) topped by glacial deposits. During glaciation, the bedrock surface was dissected by glaciers and glacial streams that produced deeply eroded stream valleys in the bedrock. OU4 is near the junction of the main bedrock valley overlain by the Mad River to the west and a tributary valley overlain by Beaver Creek.

The glacial sediments consist primarily of Wisconsinian and Illinoisian stage (about 10,000 to 100,000 years old) glacial till and outwash deposits and are more than 250 feet thick in many areas. The general stratigraphy , from top to bottom, of the glacial deposits consists of:

- An upper sand and gravel zone aquifer (outwash),
- An upper semicontinuous silt/clay zone (till),
- A lower sand and gravel zone aquifer (outwash),
- A lower, relatively continuous silt/clay zone, generally located on top of bedrock (till), and
- In some locations, a third sand and gravel zone located on top of bedrock (outwash).

The dense to very dense upper sand and gravel zone consists predominantly of light brown, well-graded medium to coarse sand, gravel, or both. Interbedded within the outwash are thin (generally less than 2 feet) layers of poorly graded fine to medium grained sand, silt, and clay which do not appear to be laterally continuous. The thickness of the upper sand and gravel zone ranges from about 2 to 54 feet, averaging about 35 feet.

The predominant soil type in the upper silt/clay zone is a hard, olive gray, silty, lean clay with varying amounts of sand and gravel. The silt/clay is locally interlayered with discontinuous beds of sand, silt, and gravel. The thickness of the upper silt/clay zone ranges from being absent to 63 feet, averaging about 23 feet.

The lower sand and gravel zone is generally similar to the upper sand and gravel zone, consisting of well graded sands and gravels, but is typically more dense. Thick sequences (up to 30 feet) of fine grained soil are present within the zone and are interpreted to be lacustrine/alluvial deposits. The thickness of the lower sand and gravel zone ranges from about 16 to 70 feet, averaging 42 feet.

The lower silt/clay zone is similar to the upper silt/clay zone consisting primarily of a hard, olive gray, silty, lean clay with varying amounts of sand and gravel. Locally interbedded with the zone are sand and gravel layers. The thickness of the lower silt/clay zone ranges from about 28 to 60 feet thick, averaging 47 feet.

5.5.2 Hydrogeology

The upper sand and gravel zone aquifer is a shallow, water table aquifer. The water table was encountered across OU4 at depths ranging from about 5 to 25 feet bgs and typically did not vary in elevation by more than 1 to 2 feet between sampling rounds. Water table elevations indicate that groundwater flows generally to the north and northwest across OU4 toward the Mad River. Hydraulic conductivity is estimated to be about 3,180 gpd/ft^2 (1.5 x 10^{-1} cm/s) (HILL, 1994).

Where present the upper silt/clay zone acts as an aquitard separating the upper and lower sand and gravel zones. The hydraulic conductivity ranges from 1.1 x 10^{-8} cm/s to 2.5 x 10^{-8} cm/s.

The lower sand and gravel zone exhibits semiconfined conditions throughout most of the OU4 area. The potentiometric surface of the lower sand and gravel zone vary slightly from the water table surface but typically have not varied in elevation by more than 1 to 2 feet between sampling rounds. The direction of groundwater flow through OU4 is generally to the west towards the Mad River (Figure 5- 3). The hydraulic gradient across this portion of OU4 is estimated to be about 1.7 x 10^{-3} ft/ft.

For more detailed information on the geography, geology, hydrology, and hydrogeology of WPAFB, consult the OU4 RI Report (HILL, 1994).

6.0 Basewide Long-Term Monitoring

Section 6 presents the results of the long-term groundwater monitoring for the Groundwater Operable Unit (GWOU) at WPAFB, Ohio.

6.1 Introduction

Long-term monitoring (LTM) was initiated for the GWOU in accordance with the recommendations presented in the *Draft-Final BMP Engineering Evaluation/Cost Analysis (EE/CA), Appendix A: BMP Groundwater Monitoring Plan* (IT, 1998). The monitoring program includes: (1) semiannual sampling of groundwater for volatile organic compounds (VOCs) - basewide wells located in BS5, OU2 , OU3, OU4, OU5, OU8, and OU10; (2) annual sampling of groundwater for VOCs - basewide wells located in BS6, Spill Site 11 (Further Action Area -B), OU8, and OU9; (3) annual sampling of groundwater for inorganics (metals) - basewide wells located in OU2, OU5, OU8, OU9, and OU10; and (4) installation of pumps suitable for micropurge sampling. Semiannual sampling for VOCs analysis is conducted on those wells located in aquifers where the potential exists for contaminant migration beyond the investigation area. Annual sampling is conducted for VOCs analysis on monitoring wells located in Aquifer Layer No. 1 in the higher elevations of Area B (Hill) where the soils are typically glacial till and silty clay. Groundwater flow through this aquifer is very slow and the potential for contaminant migration between sampling rounds is minimal. Metals sampling is conducted annually because of the limited transport characteristics of these inorganics.

The objectives of the continuing LTM for the GWOU are to:

- Collect data to monitor past detections of inorganic contaminants of potential concern (COPCs) above the Maximum Contaminant Levels (MCLs) at WPAFB that do not appear to form congruent contaminant plumes.

- Collect data to monitor areas of groundwater at WPAFB that exceed MCLs for VOCs.

- Collect monitoring data to verify the progress of ongoing remedial efforts in accordance with the RODs at OU1 and OU2.

- Collect monitoring data in accordance with the recommended action for FAA-A (off-site migration of TCE and PCE).

- Collect monitoring data in accordance with the recommended action for FAA-B (vinyl chloride site adjacent to Facility 92 - Drum Storage Area) to evaluate 1998 conditions.

6.2 Site Location and Description

A summary of the source operable units included within the GWOU is provided in the EE/CA, Appendix A. Operable Units 2, 3, 4, 5, 7, 10, and 11 are located within Areas A & C of WPAFB (Figure 1-2). Operable Units 1, 6, 8, and 9 are located within Area B (Figure 1-3). A brief description of each is provided below.

Areas A and C

- OU2 is located in the northeastern portion of Area C and consists of a Burial Site 1 (BS1), Long-term Coal Storage Pile, Temporary Coal Storage Pile, Coal and Chemical Storage Area, Building 89 Coal Storage Area, and Spill Sites (SP) 2, 3, and 10.

- OU3 is located in the western portion of Area C adjacent to the bank of the Mad River and consists of FTAs 2, 3, 4, and 5; LFs 11, 12, and 14; Earthfill Disposal Zones (EFDZs) 11 and 12; and SP1.

- OU4 is located in the southeast portion of Area C and consists of LFs 3, 4, 6, and 7 and a Drum Storage Area.

- OU5 is located at the southwest boundary of Area C and consists of LF5, FTA1, BSA4, and Gravel Lake Tanks Site.

- OU7 is located at the northeast edge of Area C and consists of LF 9.

- OU10 is located on the eastern side of Area C and consists of LF13, Heating Plant (HP) 3, Tank Farm 49A, UST 119, SP4, and East Ramp Tank Removal.

- OU11 is located at the northwest edge of Area C and consists of BS2, Chemical Disposal Area (CDA), and UST Building 4020.

Area B

- OU1 is located at the eastern edge of Area B and consists of LFs 8 and 10.

- OU6 is located at the western edge of Area B and consists of EFDZ1, LF1, and LF2.

- OU8 is located in the northern portion of Area B consists of SPs 5, 6, 7, 9, and 11; and UST71A.

- OU9 is located in the southern portion of Area B and consists of EFDZs 2, 3, 4, 5, 6, 7, 8, 9, and 10; BS3; and HP5.

As discussed in Chapter 1, the GWOU was established under the Basewide Monitoring Plan (BMP) to provide a comprehensive method for monitoring and evaluating the individual source areas (OUs), plume migration and the natural attenuation of contaminants. The BMP consists of:

- Characterization of groundwater, surface water, and sediment sufficiently to conduct a final assessment of risks to human health and the environment.

- Development, evaluation, and selection of appropriate removal actions for groundwater at WPAFB.

The specific objectives of the BMP, as presented in the *Site-Specific BMP Work Plan* (IT, 1995a), are to:

- Compile existing characterization and monitoring data from source area OUs at WPAFB to verify conceptual models, establish basewide background conditions, and summarize groundwater, surface water, and sediment contaminant conditions.

- Summarize groundwater and surface water flow and contaminant transport patterns within and adjacent to WPAFB, establishing background and Base-related conditions.

- Evaluate and modify, as necessary, existing predictive models for analysis of groundwater flow and contaminant transport to provide input data for evaluation of future risk conditions and to assist in remedial design activities.

- Assess current and future risk to human health and the environment from potential multiple source, multiple contaminant plumes for on- and off-site receptors thereby defining areas requiring removal or remedial measures.

- Prepare a coherent removal action strategy.

- Evaluate removal alternatives consistent with an overall remedy for groundwater, surface water, and sediment.

6.3 Previous Investigations

As discussed in Section 1.4, numerous investigations have been undertaken relative to groundwater contamination at WPAFB. Table 2-1 of the EE/CA provides a synopsis of the environmental studies performed on the Base as a whole and those performed on specific OUs. Site investigations began in 1981 with a preliminary assessment/records search. Since that time, investigations and/or remedial actions have progressed at varying rates at the different OUs, depending on complexity, threat to human health and the environment, timing of identification of sites, and budgetary considerations. For example, remedial actions at LF 4 were undertaken in 1987, and capping of LFs 5, 8, and 10 have already been accomplished, while preliminary assessment of the recently identified BS5 and BS6 began only in 1996. An expanded discussion of the results of identified studies is available in other documents, which delineate the extent of contamination at the different OUs. As such, the COPC sources and likely pathways for contaminant migration are well-defined. Chapter 3 of the EE/CA describes the source control measures currently in effect or planned for each OU and the groundwater extraction and treatment systems currently operating.

6.4 Basewide LTM Groundwater Sampling Using Micropurging

For the October 1998 sampling event, groundwater monitoring wells for the basewide LTM program were purged and sampled using micropurge low flow-rate techniques in place of the three-volume method presented in FPs 5-6 and 6-5. Micropurging will be used in all future sampling events because the low flow rates that are required to maintain a constant dynamic water level draw water from directly within the screened interval of the well where the pump inlet is positioned. This eliminates the purging of the entire stagnant water column and, therefore, generates a minimal amount of water to be disposed of.

Monitoring wells were purged and sampled with dedicated bladder (pneumatic) pumps. The dedicated bladder pumps were either existing in the wells from prior sampling programs or were new pumps installed just prior to purging. This section describes pump installation and micropurge sampling of the Basewide LTM program wells.

6.4.1 Pump Installation

Monitoring wells scheduled to be sampled as part of the Basewide LTM program (Section 6.5) were configured to be purged and samples using the micropurge method. Forty-five (45) wells for the basewide LTM program were recommended in the *Draft-Final BMP EE/CA* (IT, 1998) to be configured and sampled in this manner. Of the 45 wells, 10 wells required the installation of dedicated pumps. Bladder pumps were installed in the groundwater monitoring wells in accordance to FP 5.2. The following general procedures were used for installation of the dedicated bladder pumps (see FP 5.2 for more detail):

- Plastic sheeting was placed on the ground around the well casing to contain the pump assembly and associated installation equipment and supplies.
- Wells were sounded for depth to static water level and total well depth.
- Total length of the pump and tubing assembly was determined to position the pump inlet approximately one foot above the bottom of the well and in the screened interval.
- Intake and discharge tubing were measured and cut to the proper length.
- Well cap and fittings were assembled to the end of the tubing, and ensure the well cap assembly will support the pump and tubing.
- Pump and tubing assemblies were carefully lowered into the well.
- Well caps were positioned on the top of the riser casing.

All sampling pumps used to purge the wells are 1.66 inches in diameter and 44 inches in length. Pumps are constructed of stainless steel bodies with Teflon® internal bladders. The bladder pumps in the wells were positioned in the lower portion of the screened interval and pumped at sufficiently low flow rates to maintain water levels with only minimal drawdown.

6.4.2 Micropurging

Well purging is designed to remove stagnant water from the well casing and ensure that groundwater samples collected for analyses are representative of current aquifer conditions. Well purging was conducted in accordance with the following methodology.

- The background and wellhead atmosphere at each location were screened with a photoionization detector (PID) to monitor for the presence of airborne VOCs.

- After VOC screening, static water levels were measured from the top of the inner casing to the nearest 0.01 foot and recorded.

Monitoring wells were purged by the micropurge method in accordance with field procedure FP-5.2. With the micropurge method a minimum purge volume of two pump and two tubing volumes is required. Groundwater quality was considered representative of the surrounding geologic formation when the field parameters and the pumping water level in the well had stabilized as discussed below.

Purge water was monitored in the field for the field parameters of temperature, pH, specific conductivity, dissolved oxygen, and turbidity using a Horiba U-10 water quality meter. Oxidation reduction potential was monitored using a Orion Model 250 portable meter. The meters were placed in a flow-through cell and measurements were collected every five minutes during purging until a set of three stabilized readings were obtained. Readings were considered stabilized when the physical and chemical parameters were within the following limits:

- pH was within ± 0.2 Standard Units

- Water temperature was consistent within ± 1 degree Celsius (°C)

- Specific conductance was consistent within ± 50 microSiemens per centimeter (μS/cm) for readings <500 μS/cm, or ± 10% for specific conductance >500 μS/cm.

A well was also considered to be sufficiently purged if it was purged dry during micropurging. The purge logs for sample collection are presented in Appendix B and the final parameters measured just prior to sampling are summarized in Table 6-1.

Purge water was containerized, transported back to a central staging area and disposed of at a certified treatment and disposal facility.

6.5 LTM Basewide Groundwater Monitoring

Under the Basewide GWOU LTM program, groundwater samples were collected for VOCs analysis from 43 semiannual groundwater monitoring wells and 2 annual groundwater monitoring wells (Figure 6-1.) Groundwater sampling of the monitoring wells was conducted from October 16 through November 5, 1998. As specified in Table A-1 of the *Draft-Final BMP EE/CA* (IT, 1998), samples were collected from the following monitoring wells in October 1998 as part of the semiannual sampling effort and analyzed for VOCs:

BS5: BS5 P-1, BS5 P-2, BS5 P-3, and BS5 P-4.

OU2: NEA-MW34-2S and NEA-MW27-31 (OU10).

OU3: FTA2:MW02C, LF12:MW15A, 07-520-M, 05-DM-123S, 05-DM-123I, 05-DM-123D.

OU4: OU4-MW-02A, OU4-MW-02B, OU4-MW-04A, OU4-MW-03B, OU4-MW-03C, OU4-MW-12B, BMP-OU4-1B-60, and BMP-OU4-1C-84.

OU5: CW05-055, CW05-85, HD-11, HD-12M, HD-12S, HD-13S, HSA-4A (MW131M1), HSA-4B (MW131S), and HSA-5 (MW132M).

OU8: CW3-77.

OU10: OU10-MW-06S, OU10-MW-06D, OU10-MW-11S, OU10-MW-11D, OU10-MW-19D, OU10-MW-21S, OU10-MW-25S, GR-333, GR-334, NEA-MW37-1D, CHP4-MW01, GR-330, and 23-578-M.

As described in Section 6.1, annual sampling of monitoring wells is also a part of the LTM program for the GWOU. Annual samples are collected in April; results from the annual sampling effort will be presented in the next LTM report. As specified in Table A-1 of the EE/CA, samples will be collected from the following monitoring wells in April 1999 and analyzed for VOCs:

BS6: BS6 P-1 and BS6 P-2.

FAA-B: SP11-MW01, SP11-MW02, and SP11-MW03.

OU8: OU8-MW-02S, P6-1, and P6-2.

OU9: EFD04-MW06 and EFD09-M575.

Monitoring wells BS6 P-1 and BS6 P-2 were recently added to the LTM program and will be sampled annually. These two wells were sampled for the first time in November 1998 and are reported here. The sampling schedule for these two wells will be changed to annual and will be sampled again in April 1999.

As specified in Table A-1 of the EE/CA, samples will be collected from the following monitoring wells in April 1999 and analyzed for metals:

OU2: 14-554-M, WP-NEA-MW01-1S, WP-NEA-MW02-2S, WP-NEA-MW20-2S, WP-NEA-MW23-2S, WP-NEA-MW24-2S, and WP-NEA-MW31-2S.

OU5: CW15-055.

OU8: OU8-MW-02D and OU8-MW23D.

OU9: P4-2, WP-EFDZ3-MW02, WP-EFDZ3-MW03, and WP-EFDZ8-MW01.

OU10: 20-566-M, 25-582-M, 25-583-M, 25-584-M, and OU10-MW-06S.

Table A-1 of the EE/CA is presented in Appendix A of this report and contains the monitoring frequency, sampling months, analytical parameters and other sampling rationale for all groundwater and leachate sampling locations monitored under the LTM program.

6.5.1 Groundwater Sampling Methods

Immediately after purging, groundwater samples were collected following field procedure FP 6-5 using the same dedicated pumps. The off-site laboratory (OSL) provided new, certified clean and prepreserved sample containers (VOA vials). Groundwater samples for VOC and total metals analyses were collected by filling each sample container directly from the dedicated Teflon®-lined discharge tubes for each well. Dissolved metals samples were collected in accordance with field procedure FP 6-8 by connecting a 2-micron filter cartridge to the discharge tubing, then purging the cartridge for approximately one minute prior to sampling. Samples were collected directly from the filter cartridge. Samples for total and dissolved metals analysis were preserved after filling and were field checked to ensure the pH was less than 2 by pouring a small amount of sample out of the container onto pH paper. VOC samples were not checked for proper preservation to preserve the zero headspace of the filled VOC vials.

After collection, samples were placed on ice in a cooler and maintained at 4 °C until shipped to the laboratory. Generally, samples were shipped the day of collection; however, in some cases, samples were held overnight in a secured sample cooler for shipment the next day. Samples were shipped by overnight carrier to the Quanterra North Canton, Ohio laboratory.

6.5.2 Field Quality Control Samples

As a check on the quality of field activities (including sample collection, containerization, shipping, and handling), trip blanks, ambient blanks, and field duplicates were collected with specified frequencies following the Project Work Plan (PWP) guidelines. The frequency with which these samples were taken, and number of such samples, are discussed below. In addition, quality assurance (QA)/quality control (QC) requirements for field analyses is also discussed below. Sampling equipment was dedicated for each well, therefore, equipment rinsate samples were not required.

A trip blank is a sample bottle filled by the laboratory with analyte-free laboratory reagent water, transported to the site, handled like a sample but not opened, and returned to the laboratory for analysis. One trip blank consisting of two 40-ml vials was sent to the laboratory with every sample set required to be analyzed for VOCs. Trip blanks were analyzed for VOCs only.

An ambient field blank is water poured into a sample container at the sampling location, handled like a sample, and transported to the laboratory for analysis. The water sampled must be the same water used in any decontamination activities conducted on site. This water is normally organic-free deionized water. One ambient blank was collected during the sampling event for OSL analysis. Ambient blanks were analyzed for all target analytes.

A field duplicate is an additional sample collected independently at a sampling location during a single act of sampling. A duplicate sample is used to assess the representativeness of the sampling procedure. The minimum total number of field duplicates required for each analysis is equal to 10 percent of the samples collected.

The QA/QC program ensures that valid and defensible data are obtained during sampling. QA/QC is performed in accordance with Section 9.0 of the Quality Assurance Project Plan, Volume 2 of the Project Work Plan (ES, 1991). The analytical QA/QC sampling protocol is summarized as follows:

QA/QC Sample Type	Frequency
Trip Blanks	1 per shipping day
Field Duplicates	1 every 10 samples
Ambient Blank	1 per sampling event
Matrix Spikes	1 every 20 samples
Matrix Spike Duplicates	1 every 20 samples

6.5.3 Sample Management

Groundwater samples for OSL VOC and total and dissolved metals analysis were preserved, collected, and handled in accordance with Section 4.0 of Volume 1 and Field Procedure (FP) 6-12 of Volume 2, Appendix C of the Project Work Plan (ES, 1991). Each sample was designated with a unique sample number which identified the location and type of sample collected. The sample number format is as follows:

- Project Identification - The designation "LTM" (Long-Term Monitoring) is used to identify the project.

- Sample Location Identification - Each location is identified by a unique designation. The following designators were used to show the location of each well: “OU” (Operable Unit), "LF" (Landfill), “CHP" (Central Heating Plant), “WP” Wright-Patterson, “NEA" Northeast Area, “EFDZ” Earthfill Disposal Zone, “xx-0yy-M” Phase 2, Stage 1; site No.-well No., “xx-5yy-M” Phase 2, Stage 2; site No.-well No., “CW” OU5 off-site well, “GR” US Geological Survey, and “SP11" (Spill Site 11).

- Sample Media and Sample Number - An alpha-numeric code was used to identify the sample media and the sequence number of the sample. The following designator was used during this task: "GW####" (groundwater and sampling event, i.e. GW01 for the first sampling event under the LTM program).

- Additional designators for QA/QC use - Duplicate samples were identified with "5" preceding the well number designator. Matrix Spike and Matrix Spike Duplicates had "MS" and "MS DUP", respectively, appended to the sample media and sample number designator.

For example, a complete sample identification for a groundwater sample collected from monitoring well No. 1 at Heating Plant 4 during the first round of sampling would be as follows: LTM-CHP4-MW01-GW01. Please note that samples collected for the Baseline LTM under the BMP project in April 1998 had the sample prefix "ROD" for Record of Decision. These samples also had the suffix "GW01" representing the first sampling event under that program.

6.5.4 Sample Handling

Samples were handled in accordance with procedures in Section 5.11.3 of Volume 1 and FP 6-12 of Volume 2, Appendix C of the Project Work Plan. Sample numbers, descriptions and other pertinent information were entered into field logbooks by the Field Team Leaders. In addition, Chain-of-Custody records were completed for each sample. Chain-of-Custody forms contain sample team members, sample numbers, date and time of collection, container types and volumes, preservatives and analytical parameters. Chain-of-Custody forms are presented in Appendix C.

All samples were under direct control of the sampling team members or Site Coordinator until custody was transferred to the overnight freight carrier. While in transit, samples were placed in coolers with custody seals to ensure against tampering.

6.5.5 Sample Containers and Preservation

Sample containers used for OSL VOC analysis were 3 x 40 ml VOA vials with Teflon®-lined septum caps, prepreserved with hydrochloric acid at the providing laboratory (Quanterra). Total and dissolved metals samples were collected in 1 liter polyethylene bottles. Samples were preserved with nitric acid in the field. All containers were labeled with the sample number, collector's initials, date and time of collection, location of sampling point, preservatives added and analytical parameters requested. All samples for chemical analysis were kept at a maximum 4°C by placing the sample containers on ice in insulated coolers until relinquished to FEDEX®.

6.5.6 Project Generated Wastes

Wastewater generated during the investigation consisted of monitoring well purge water. Wastewater generated during the field activities pumped into two 55-gallon drums on the back of each field sampling truck. After filling, the drums then were pumped into two 750-gallon storage tanks staged in the contractors parking lot near OU4. Approximately 1,500 gallons of wastewater were generated during LTM field activities which included the well development at OU4 (Chapter 5.0). The wastewater was transported by vacuum tank-truck to a certified treatment and disposal facility.

6.5.7 Procedure Variances

The only variance to the task SOW was the use of the existing dedicated Grundfos® electric submersible pumps in wells GR-333, GR-334 and FTA2:MW02C in place of installing new bladder pumps. The pumps and fixtures in these wells appeared to be permanently attached and were left in-place.

6.6 Analytical Results

The analytical results from the Basewide LTM sampling for each area are presented in Table 6-2 along with historical groundwater analytical data for each well. Figures 6-2 through 6-9 present the detected concentrations of VOCs (concentrations exceeding MCLs are denoted in red).

As defined in the EE/CA, the remediation goal for organic contaminants of concern (benzene; 1,2-DCA; 1,2-DCE; TCE; vinyl chloride; and PCE) is the MCL for each constituent. The TCE concentration in eleven monitoring wells exceeded the MCL (5 μg/L): OU4-MW-02B, OU4-MW-03B, OU4-MW-03C, OU4-MW-12B, CW05-055, CW05-085, HD-11, OU10-MW-06S, OU10-MW-11D, OU10-MW-19D, and OU10-MW021S. The maximum detected concentration of TCE (83 μg/L) was found in well CW05-085 (OU5). One well, HSA-4A (MW131M), contained a concentration of vinyl chloride (4.2 μg/L) that exceeded the MCL (2 μg/L). The PCE concentration in six monitoring wells exceeded the MCL (5 μg/L): BS5 P-3, BS5 P-4, NEA-MW27-31, OU10-

MW-11S, OU10-MW-25S, and GR-330. The maximum detected concentration of PCE (33 μg/L) was found in wells BS5 P-3 and BS5 P-4.

6.7 Data Evaluation

The following sections discuss the analytical results from the Basewide LTM sampling for each area. For wells that have a history of VOCs above MCLs, a discussion of the historic trend in concentrations is presented. Table 6-2 presents a summary of the Basewide LTM and historic groundwater analytical data for each well. Figures 6-10 through 6-32 present the historical groundwater analytical data for each well where chemicals of primary concern were detected.

BS5

One VOC, PCE, has previously exceeded the MCL at BS5. Historic VOC concentrations for the sampling locations in BS5 are presented in Table 6-2 and Figures 6-10 and 6-11. As seen in Figure 6-10 and 6-11, PCE has been detected at concentrations above the MCL in wells BS5 P-3 and PS5 P-4 for the October 1998 sampling and the only previous sampling in June 1997. Concentrations of PCE in both wells increased slightly over those from the June 1997 sampling. TCE was detected in three wells (BS5 P-1, BS5 P-3, and BS5 P-4), however, the concentrations were below the MCL. No COPCs have been detected in BS5 P-2.

BS6

Recently added monitoring wells BS6 P-1 and BS6 P-2 were sampled under the Basewide LTM program and are designated as annual monitoring wells. Of the VOCs detected in BS6 P-1 during the November 1998 sampling effort, none were COPCs. No VOCs were detected in BS6 P-2 (Table 6-2).

OU2

Two VOCs have previously exceeded MCLs at OU2. Historic VOC concentrations for the sampling locations in OU2 are presented in Table 6-2 and Figure 6-12. As seen in Figure 6-12, TCE was detected in NEA-MW34-2S during the December 1992 sampling event at 15 μg/L. In subsequent sampling rounds at this well, TCE concentrations have been below detection limits.

PCE has been consistently detected above the MCL in NEA-MW27-31. PCE was detected at 18 μg/L in the recent sampling event.

OU3

VOCs that have previously exceeded MCLs at OU3 are benzene and TCE. Historic VOC concentrations for the sampling locations in OU3 are presented in Table 6-2 and Figures 6-13 through 6-15. Benzene was detected above the MCL in FTA2:MW02C (6 μg/L) in July 1993. Subsequent sampling indicated that concentrations of benzene were below the MCL or detection limit. TCE was detected above the MCL in LF12:MW15A (12.11 μg/L) in July 1993. Subsequent sampling indicated that concentrations of TCE were below the MCL or detection limit. Concentrations of TCE and 1,2-DCE detected in other wells were below MCLs.

OU4

Vinyl chloride and TCE have previously been equal to or exceeded MCLs at OU4. Historic VOC concentrations for sampling locations in OU4 are presented in Table 6-2 and Figures 6-16 through 6-19. Vinyl chloride was detected at the MCL in OU4-MW-04A in December 1998; subsequent samples were below the detection limit. TCE has been consistently detected above the MCL in OU4-MW-02B, OU4-MW-03B, OU4-MW-03C, and OU4-MW-12B. The concentrations of TCE in these wells appear to be decreasing over time. Concentrations of 1,2-DCE detected in wells have been below the MCL.

OU5

VOCs that have previously exceeded MCLs at OU5 are TCE, vinyl chloride, and PCE. Historic VOC concentrations for the sampling locations in OU5 are presented in Table 6-2 and Figures 6-20 through 6-24. TCE concentrations above the MCL were detected during the October 1998 in wells CW05-055 (6.1 μg/L), CW05-085 (83 μg/L), and HD-11 (51 μg/L). Wells that have had previous TCE concentrations above the MCL but whose concentrations are below the MCL for the October 1998 sampling event include HSA-4A (MW131M), HSA-4B (MW131S), and HSA-5 (MW132S). Vinyl chloride was detected above the MCL in HSA-4A (MW131M) (4.2 μg/L). Previous concentrations of vinyl chloride at this well have been below the detection limit. Concentrations of PCE above the MCL have been previously detected in wells HSA-4B (MW131S) (6.7 and 6.3 μg/L) and HSA-5 (MW132S) (12.1 and 10.5 μg/L). During the October 1998 sampling event, concentrations of PCE in these wells were either below the MCL or the detection limit. Concentrations of 1,2-DCA and 1,2-DCE detected in the wells at OU5 have been below the MCL.

OU8

TCE has previously exceeded the MCL at OU8. Historic VOC concentrations for sampling locations in OU8 are presented in Table 6-2 and Figure 6-25. During three sampling events, TCE concentrations in CW3-77 (8 μg/L, 9 μg/L, and 7.4 μg/L) were above the MCL. The concentration of TCE (3.7 μg/L), however, was below the MCL during the October 1998 sampling event. Concentrations of 1,2-DCE and PCE detected in CW3-77 have been below the MCL.

OU10

VOCs that have previously exceeded MCLs at OU10 are benzene, TCE, and PCE. Historic VOC concentrations for the sampling locations in OU5 are presented in Table 6-2 and Figures 6-26 through 6-32. Benzene was detected above the MCL in NEA-MW37-1D (7 μg/L) in August 1993. Subsequent sampling at this well indicates that benzene concentrations are below the detection limit. TCE concentrations above the MCL were detected during the October 1998 sampling event in wells OU10-MW-06S (14 μg/L), OU10-MW-11D (10 μg/L), OU10-MW-19D (5.7 μg/L), and OU10-MW-21S (9.4 μg/L). Wells that have had previous TCE concentrations above the MCL but had reported concentrations below the MCL or detection limit for the October 1998 sampling event include GR-333, GR-334, CHP4-MW01, and 23-578-M. In recent sampling, concentrations of PCE above the MCL were detected in wells OU10-MW11S (12 μg/L), OU10-MW25S (18 μg/L), and GR-330 (30 μg/L). Wells that have had previous PCE concentrations above the MCL but had reported concentrations below the MCL or detection limit for the October 1998 sampling event include OU10-MW06D.

7.0 Basewide Groundwater Operable Unit Evaluation

This section presents a site-wide evaluation of LTM results for the October 1998 sampling event. The LTM results are compared to the concentration gradients developed during the RI activities (IT, 1997d). These comparisons were used to identify noticeable trends in contaminant concentrations across the site. Additionally, water level information from the October 1998 LTM sampling was compared against past hydrogeologic data to identify any general trend that suggests changes are occurring in groundwater flow conditions at the Base.

7.1 Data Analysis

Both hydraulic head and analytical data were evaluated on a site-wide basis. This analysis included comparison of October 1998 LTM data to RI data to changes in conditions between the sampling periods.

7.1.1 Hydraulic Head Data

Hydraulic head data from each well sampled in the October 1998 sampling event were plotted on basewide potentiometric surface maps developed for the site from the BMP. Water levels used to create the basewide potentiometric surface maps were measured in July 1995. While the LTM program wells represent a small subset of the data locations used to develop the original potentiometric surface maps, they can be compared for overall trends in groundwater flow changes. These data were evaluated to determine if potentiometric surfaces and resultant groundwater flow characteristics identified in the BMP remain valid.

7.1.2 Analytical Data

Analytical results for the following organic compounds from the October 1998 LTM sampling event were plotted on site-wide maps: TCE, PCE, 1,2-DCE, 1,2-DCA, vinyl chloride, and benzene. Concentrations from these compounds were used to develop contour plot maps for each of the three aquifer layers. These maps also present compound-specific concentration contours that had been developed from existing RI data (IT, 1997d). The current and early 1990s findings were compared to evaluate whether there exists:

- Discernable differences in the distribution of VOC detections between the two periods
- Discernable differences in distributions of VOC concentrations between the two periods.

7.2 Hydraulic Conditions

Hydraulic head measurements collected from wells sampled during the October 1998 LTM sampling event are summarized in Table 7-1. Note that these water level data were collected over a period of several weeks and do not provide a "snapshot" of conditions. These data are plotted on potentiometric surface maps for each of the three aquifer layers in Figures 7-1 through 7-3.

Distributions of hydraulic heads from October are generally consistent with the potentiometric surface contours from the BMP. One significant exception is head data from Layer 1 from Burial Site 5 wells located along the western flight line in Area B (Figure 7-1). Head from these wells are slightly depressed from those predicted from the RI data. Wells at Burial Site 5 were installed after the BMP so they were not part of the potentiometric data set used in preparing the potentiometric surface maps for this area in the BMP (1995). The head differences noted here may not be related to actual changed head conditions but rather the differences are likely related to the existence of site specific information for conditions in the Burial Site 5 area. While these heads may not actually be depressed they do suggest that predicted flow directions are consistent with the current measurements.

Heads within the OU5 area for Layer 1 and Layer 2 (Figures 7-1 and 7-2, respectively) are relatively depressed in the 1998 data compared to the BMP contours. However, the elevation and distribution of heads in the two data sets are generally consistent. Groundwater flow directions remain the same. Based on these observations, the interpreted sitewide groundwater flow directions from the BMP remain valid through the current sampling period.

Limited data points in the Layer 3 wells (Figure 7-3) remain consistent with the BMP predictions.

7.3 Analytical Findings

The following discussion presents the observations of the basewide groundwater operable unit evaluation for the October 1998 LTM event. These findings are discussed by contaminant.

7.3.1 TCE

Detections of TCE in each aquifer layer reported from the October 1998 sampling event generally fall within the areas of interpreted TCE plumes from the early 1990s RI data (Figures 7-4 through 7-6). Each layer is discussed below.

Layer 1

Data presented in Chapter 6.0 indicate that TCE concentrations in known plumes at OUs 1, 4, and 5 have generally decreased with time. Exceptions to this occur primarily in some monitoring wells at OU5 (Table 6-2). Concentrations of the TCE detections presented in Figures 7-4 through 7-6 generally fall within the contour levels of plumes developed from the RI sampling. Exceptions include wells where non-detects were reported in areas of previously identified plumes such as south of the OU 10 plume (Layer 1) and down-gradient of OU 5 (Layer 1) both depicted in Figure 7-4.

Two results at higher concentrations than those presented in the BMP are within the large plume immediately southwest of OU 10. TCE was detected at concentrations of 9.4 and 4.9 µg/L at wells OU10-MW-21S and GR-333, respectively. These concentrations are, however, consistent with previous sampling results.

Layer 2

Monitoring well BMP-OU4-01B-60 located within the interpreted Layer 2, 1ppb TCE plume contour on the downgradient side of OU4 (Figure 7-5). TCE was detected at 4.5 µg/L in this newly installed well (first sampled in October 1998). Because this well was installed after the RI, the data from this well may not be indicative of down-gradient migration of TCE. Rather, this data provides additional information about the down-gradient distribution of TCE in the area of OU4.

TCE concentrations in well OU10-MW-06S (Layer 2, OU 10) are slightly higher the those estimated from the RI sampling (14 µg/L versus 1 to 5 µg/L). Overall, however, the data are indicative of ongoing degradation of TCE in the 5 to 10 year period since the RI sampling. This finding is consistent with BMP flow and transport modeling predictions that indicate that 30 to more than 60 years would be required before TCE concentrations will be reduced to below detection limits.

Layer 3

Concentrations in this layer for sampled locations are either at or below predicted concentrations (Figure 7-6).

7.3.2 PCE

The detections of PCE reported from the October 1998 sampling event consistently fall within the areas of interpreted PCE plumes from the early 1990s RI data (Figures 7-7 through 7-9). Based on these data, the distribution of PCE detections from the October 1998 LTM event are not indicative of significant downgradient movement of PCE since the RI sampling.

Data presented in Chapter 6.0 indicate that PCE concentrations in known plumes at OUs 1, 4, and 5 have generally decreased or remained constant with time. Concentrations of the PCE detections presented in Figures 7-6 through 7-9 are consistently within or lower than the contour levels of plumes developed from the RI sampling. These data are indicative of ongoing degradation of PCE in the 5 to 10 year period since the RI sampling. This finding is consistent with BMP flow and transport modeling predictions that indicate that natural degradation properties will result in the decrease in PCE concentrations with time.

7.3.3 1,2-DCA

1,2-DCA was not detected in any samples collected during the October 1998 sampling event. Figures 7-10 through 7-12 have been provided with the locations of the non-detects. This finding is consistent with previous sampling at the wells included in the October 1998 LTM sampling event.

7.3.4 1,2-DCE

The detections of 1,2-DCE reported from the October 1998 sampling event consistently fall within the areas of interpreted 1,2-DCE plumes from the early 1990s RI data (Figures 7-13 through 7-15).

Monitoring well BMP-OU4-01B-60 was installed in October 1998 and is located within the interpreted Layer 2, 1ppb TCE plume contour on the downgradient side of OU4 (Figure 7-14). 1,2-DCE was detected in this well at a concentration of 3.1 µg/L. Adjacent Layer 3 well BMP-OU4-01C-84 had 1,2-DCE detected at a concentration of 1 µg/L (Figure 7-15). Because BMP-OU4-01C-84 well was installed after the OU4 RI, the data from this well may not be indicative of down-gradient migration of 1,2-DCE. Rather, this data provides additional information about the distribution of 1,2-DCE in the area of OU4. Based on these findings, the distribution of 1,2-DCE detections from the October 1998 LTM event are not indicative of significant down-gradient movement of 1,2-DCE since the RI sampling.

Data presented in Chapter 6.0 indicate that 1,2-DCE concentrations in known plumes at OUs 4 and 5 have remained constant or have increased slightly from previous sampling results. Concentrations of the 1,2-DCE detections presented in Figures 7-13 through 7-15 are generally within or lower than the contour levels of plumes developed from the RI sampling.

7.3.5 Vinyl Chloride

Vinyl chloride was detected at greater than 1 µg/L in two wells sampled during the October 1998 LTM sampling, in HD-13S in Layer 1 at OU 5 at a concentration of 1.5 µg/L (Figure 7-16) and HSA-4A (MW131M) in Layer 2 at OU 5 at a concentration of 4.2 µg/L (Figures 7-17). These wells are located immediately down-gradient of OU 5 in areas where vinyl chloride plumes were identified during the BMP and, therefore, do not appear to be related to increasing concentrations or movement of vinyl chloride. Although these data do not appear to be indicative of loading or mobilization of vinyl chloride, concentrations of vinyl chloride in these and other wells should continue to be monitored during future LTM sampling events to evaluate if degradation of higher-end halogenated compounds contributes to additional loading of TCE.

7.3.6 Benzene

Benzene was not detected in any samples collected during the October 1998 sampling event. Figures 7-19 through 7-21 have been provided with the locations of the non-detects. This observation is consistent with previous sampling at the wells included in the October 1998 LTM sampling event.

7.4 Summary

The analytical data from the October 1998 LTM sampling indicate that degradation of TCE, PCE, 1,2-DCE, and vinyl chloride is continuing at WPAFB. Additionally, these data indicate that the locations of organic known plumes are generally stable as significant down-gradient movement of organics has not been observed.

8.0 References

CH2M HILL, 1994, Draft Remedial Investigation Report Landfills 3, 4, 6, and 7, and Drum Staging, Wright-Patterson Air Force Base, Ohio, September.

CH2M HILL, 1997, Operation and Maintenance Plan Landfills 3, 4, 6, and 7, and Drum Staging / Disposal Area, Wright-Patterson Air Force Base, Ohio, April.

CH2M HILL, 1998, OU-4 Landfill Gas Monitoring Technical Memorandum, Wright-Patterson Air Force Base, Ohio, June.

Dames and Moore, Inc., 1986, Draft Site Investigation Report, Landfills 8 and 10, Wright-Patterson Air Force Base, Ohio.

Engineering Science, Inc., (ES), 1982, USAF Installation Restoration Program, Phase I: Records Search, Wright-Patterson Air Force Base, Ohio.

Engineering Science, Inc., (ES), 1990a, Analysis of Soil Gas Survey Results for Landfill 8, the Fire Training Area Adjacent to Landfill 8, Landfill 10 and the Chemical Disposal Trenches at Wright-Patterson Air Force Base, Ohio.

Engineering Science, Inc., (ES), 1990b, Installation Restoration Program (IRP), Project Work Plan for Remedial Investigations and Feasibility Studies at Wright-Patterson Air Force Base, Ohio, as amended through April 1992.

Engineering Science, Inc., (ES), 1990c, DRAFT Installation Restoration Program (IRP) Analysis of Magnetic Survey Results for Landfills 3, 4, 5, 6, 7, 8, 10, 11, and 12 and the Trenches at Landfill 10 at Wright-Patterson Air Force Base, Ohio, June 1990.

Engineering Science, Inc., (ES), 1991, DRAFT Installation Restoration Program (IRP) Geophysical Survey Report for Work Conducted at Landfills 3, 4, 5, 6, 7, 8, 10, 11, and 12 at Wright-Patterson Air Force Base, Ohio, May 1991.

Engineering Science, Inc., (ES), 1992a, Geophysical Survey Report for Work Conducted at Landfills 3, 4, 5, 6, 7, 8, 10, 11, and 12 at Wright-Patterson Air Force Base, Ohio.

Engineering Science, Inc., 1992b, Installation Restoration Program Focused Remedial Investigation Report for Landfills 8 and 10 at Wright-Patterson Air Force Base, Ohio, March.

Engineering Science, Inc., (ES), 1992c, Installation Restoration Program (IRP), Analysis of Soil Gas Survey Results for Landfill 5 at Wright-Patterson Air Force Base, Ohio, January 1992.

Engineering Science, Inc., (ES), 1992d, Installation Restoration Program (IRP), Analysis of Soil Gas Survey Results for Fire Training Area 1 at Wright-Patterson Air Force Base, Ohio, January 1992.

Engineering Science, Inc., 1993, Installation Restoration Program Off-Source Remedial Investigation Report for Landfills 8 and 10 at Wright-Patterson Air Force Base, Ohio, March.

Geraghty & Miller, Inc., 1987, Mad River Well Field Assessment, City of Dayton, Ohio, Geraghty & Miller, Inc., Milwaukee, Wisconsin.

IT Corporation (IT) 1992, OU5 System Performance Monitoring Plan, Wright-Patterson Air Force Base, April.

IT Corporation (IT), 1992a, Volume 5, Field Investigation Report, Battelle Environmental Management Operations, EMO-1028 Vol. 5, AD-902, Issued March 1991, Reissued March 1992, Richland, Washington.

IT Corporation (IT), 1993, Installation Restoration Program Work Plan for Remedial Design of a Source Control Operable Unit Landfills 8 and 10, Wright-Patterson Air Force Base, March.

IT Corporation (IT), 1994, Basewide Removal Action Plan for Landfill Capping, Wright-Patterson Air Force Base.

IT Corporation (IT), 1995, Installation Restoration Program Final Remedial Investigation Report Operable Unit 5, Wright-Patterson Air Force Base, August.

IT Corporation (IT), 1998, Draft-Final Engineering Evaluation/Cost Analysis Groundwater Basewide Monitoring Program, Wright-Patterson Air Force Base. Evaluation of Remedies for Groundwater Operable Unit, Wright-Patterson Air Force Base, Ohio.

Kelchner Environmental, Inc. (Kelchner), 1997, OU1 Final Operations and Maintenance Plan - Part 4.

Weston, 1985, USAF Installation Restoration Program Phase II, Stage 1: Problem Confirmation and Quantification Study.

Weston, 1989, Installation Restoration Program Stage 2 Report for Wright-Patterson Air Force Base, Ohio, July 1989.

Wright-Patterson Air Force Base (WPAFB), 1992, Installation Restoration Program Focused Remedial Investigation Report for Landfills 8 and 10 at WPAFB, Ohio

Wright-Patterson Air Force Base (WPAFB), 1993, Record of Decision: Source Control Operable Unit - Landfills 8 and 10, May.

Table 2-1

OU1 Remedial Action Groundwater Quality Monitoring
Sample Handling Criteria
Wright-Patterson AFB, Ohio

Parameter	Container	Sample Preservative	Holding Time
Volatiles	Three x 40-ml glass vials, no headspace, teflon-lined septum cap	HCl to pH ≤ 2 using 4 drops HCl prior to sampling; Store @ 4°C	Analyze within 14 days
Semi-Volatiles	Two x 1 amber glass container, Teflon-lined cap	Store @ 4°C	Extract within 7 days; analyze within 40 days after extraction
Dioxin/Furans	Two x 1 liter amber glass bottle, Teflon-lined cap	Store @ 4°C	Extract within 1 year; analyze within 90 days after extraction
Metals	One 1 liter polyethylene bottle	HNO^3 to pH ≤ 2 Store @ 4°C Field-filter (FP 6-8)	6 months
Pest/PCBs	One x 1 liter amber	Field-filter (FP 6-8) Store @ 4°C	Extract within 14 days; 40 days to analyze
Ammonia	One x 500 ml poly	H_2SO_4 to pH ≤ 12 Store @ 4°C	Analyze within 28 days
Cyanide	One x 500 ml poly	NaOH to pH > 12 Store @ 4°C	Analyze within 14 days
Extra Extractable	One x 1 liter amber	Store @ 4°C	

Table 2-2
LF08/10 Annual Groundwater Monitoring Field Parameters
Long-Term Monitoring Program: October 1998
Wright-Patterson AFB, Ohio
Page 1 of 3

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (mV)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)	Well Went Dry (Y/N)
02-003-M	10/26/98	4.12	13.6	NA	0.92	8	-79.1	0.37	NR	
LF08-MW02A	10/26/98	5.06	12.9	7.55	1.33	19	-101.6	1.88	NR	
LF08-MW02C	10/26/98	12.54	15.1	7.37	1.34	101	-91	3.98	NR	
LF08-MW04A	10/19/98	34.47	12.2	7	0.734	41	-61.1	1.42	1.02	
LF08-MW04B	10/20/98	31.54	11.3	6.52	0.728	17	-57	0.54	0.91	
LF08-MW04C	10/29/98	22.98	13.7	NA	0.769	160	82 5	10.48	NR	Y
LF08-MW06A	10/28/98	26.08	12.4	NA	1.34	31	-14	0.52	NR	
LF08-MW06B	10/23/98	12.76	11.6	6.96	0.65	881	26.6	8.29	NR	
LF08-MW06C	10/23/98	Dry								
LF08-MW09A	10/22/98	15.3	11.9	7.11	0.634	26	49.2	7.22	0	
LF08-MW09B	10/22/98	14.95	14.5	6.56	0.864	54	149.6	5.05	NR	
LF08-MW10A	10/19/98	25.35	14.5	6.76	0.735	18	-111.5	2.75	NR	
LF08-MW10B	10/19/98	23.19	14.5	6.2	1.81	4	-16.8	1.07	NR	
LF08-MW10C*	10/29/98	22.3	14.8	6.54	1.73	OFF SCALE	24	3.62	NR	Y
LF08-MW101	10/22/98	32.01	13.2	7.25	0.659	OFF SCALE	5	10.13	NR	
LF08-MW102	10/22/98	35.42	13.4	7.2	0.513	276	-136.5	8 65	NR	
LF08-MW103	10/26/98	33.96	13.8	3.96	0.609	OFF SCALE	-67.7	2	NR	

Table 2-2
LF08/10 Annual Groundwater Monitoring Field Parameters
Long-Term Monitoring Program: October 1998
Wright-Patterson AFB, Ohio

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (mV)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)	Well Went Dry (Y/N)
LF10-MW04A	10/28/98	102.15	13.1	NA	0.915	93	-94.2	7.84	NR	
LF10-MW04B	10/27/98	99.22	13.3	9.01	0.592	101	102.5	3.54	NR	
LF10-MW04C	10/29/98	Dry								
LF10-MW05B	10/23/98	20.11	12.7	7.08	0.755	11	-26.6	2.1	NR	
LF10-MW05C*	10/29/98	10.65	14.6	6.96	1.39	100	-66.5	11.42	NR	Y
LF10-MW06A	10/27/98	72.09	13 3	7.48	0.66	18	19.9	9.2	NR	
LF10-MW06B	10/26/98	34.7	15 5	7.13	0.812	15	55.1	3.08	NR	
LF10-MW08A-2	10/20/98	67.89	11.7	6.16	1.07	85	184.2	10.87	NR	
LF10-MW08B	10/29/98	11 76	15.9	6.38	1.92	17	6.6	1.36	NR	
LF10-MW09A	11/1/98	51.62	12	7.4	0 52	180	-132.8	0.2	NR	
LF10-MW09B	10/19/98	49.97	12.8	6.56	1.3	10	-160.2	4.44	NR	
LF10-MW09C	10/29/98	36.07	12.1	6.52	1.07	22	-55.3	2.09	1.31	

Table 2-2
LF08/10 Annual Groundwater Monitoring Field Parameters
Long-Term Monitoring Program: October 1998
Wright-Patterson AFB, Ohio
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Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (mV)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)	Well Went Dry (Y/N)
LF10-MW11A	10/26/98	30.37	12.3	6.8	0.504	26	-71.9	1.42	NR	
LF10-MW11B	10/26/98	28.32	12.3	6.41	0.778	81	-78.8	1.18	NR	
LF10-MW-102*	10/29/98	61.45	13.8	7.08	0.809	OFF SCALE	96.9	4.19	NR	Y
LF10-MW103*	10/22/98	33.91	15	6.16	1.67	OFF SCALE	-73.8	7.22	NR	Y
LF10-MW104	10/22/98	Dry								
LF10-MW105*	10/22/98	52.2	13.2	7 04	0.451	477	120	ERR	NR	Y

* - Parameters taken one day earlier
BTP - Below top of pump
DO - Dissolved Oxygen
NA - Not available
NR - No reading
ORP - Oxygen Reduction Potential
ERR- equipment error

Table 2-3
OU1 Extraction Well Sampling Field Parameters
LTM Program
Wright-Patterson AFB, Ohio

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (mV)	Turbidity (NTU)	ORP (mv)	DO (mg/L)
Landfill 8								
EW-0803	11/2/98	40 4	10.5	6.43	1.14	166	NR	9 54
EW-0807	11/3/98	DRY						
EW-0812	11/2/98	42.28	12.3	6 16	2 53	102	-6 1	9 74
EW-0816	11/2/98	54 56	12 1	6.27	2.66	631	-18 3	9 99
Landfill 10								
EW-1001	10/29/98	24 4	Parameters not measured			--	--	--
EW-1003	10/29/98	22.39	Pump not producing water					
EW-1008	10/29/98	DRY						
EW-1012	10/29/98	30 52	15 6	6 48	1 75	400	-22.1	11 67
EW-1015	10/30/98	48 4	Would not sample - dry					
EW-1019	11/2/98	Obstructed	13 2	5 72	1 6	0	69 2	9 77
EW-1020	11/2/98	33 75	Would not sample - dry					
EW-1024	10/30/98	39.66	16	6 25	1	278	-52 1	10 27
EW-1025	10/30/98	29 85	Would not sample - dry					
LF8/10-LW04-1998	10/30/98	NA	15 8	6.45	2 03	55	NA	NA

* - Parameters taken one day earlier
BTP - Below top of pump
DO - Dissolved Oxygen
NA - Not applicable
NR - No reading due to hydrocarbon sheen on water surface
ORP - Oxygen Reduction Potential

Table 2-4

OU1 Leachate Discharge Line Sampling Program
Wright-Patterson AFB, Ohio

Parameter	Analytical Method[1]	Container	Preservative	Holding Time
Voletile Organics 1,2-Dichloroethene Benzene Methylene Chloride Toluene	EPA 624	Three 40-ml glass vials, no headspace, Teflon-lined septum cap	HCl to pH ≤ 2, using r drops Hcl prior to sampling, store @ 4°C.	Within 14 days
Metals (total) Arsenic Cadmium Chromium Copper Lead Mercury Molybdenum Nickel Selenium Zinc	EPA 200	One 1 liter polyethylene bottle	HNO_3 to pH ≤ 2, store @ 4°C	6 months
Oil and Grease	EPA 413.1	One 1 liter amber glass	H_2SO_4 to pH ≤ 2, store @ 4°C	28 days
Total Suspended Solids	EPA 160 2	One 250-ml polyethylene	store @ 4°C	7 days
Chemical oxygen Demand	EPA 410 1	One 250-ml poly or polyethylene	H_2SO_4 to pH ≤ 2, store @ 4°C.	28 days
pH	EPA 150.1	One 25-ml glass or polyethylene	None Required	Analyze immediately
Total Flow and Daily Flow	N/A	Field reading from totalizing flow meter and strip chart recorded	N/A	N/A

Table 2-5

OU1 Compliance Levels for Chemicals of Concern
Wright-Patterson AFB, Ohio

Chemicals of Concern	ROD Compliance Level (ug/L)	Maximum Contaminant Level (MCL) (ug/L)
Volatile Organic Compounds (VOCs)		
Benzene	0.62	5
Chloroform	0.28	NA
1,4-Dichlorobenzene	NA	75
trans-1,2-Dichloroethene	0.0677	70
Ethylbenzene	NA	700
Methylene Chloride	6.22	NA
Toluene	NA	1000
Trichloroethene	3.03	5
Vinyl Chloride	0.0283	2
Semivolatile Organic Compounds (SVOCs)		
Benzo(a)pyrene	NA	0.2
Diethylphthalate	NA	NA
4-Methylphenol	NA	NA
Naphthalene	NA	NA
Dioxins/Pesticides/PCBs		
2,3,7,8 TCDD	5.67×10^{-7}	3.00×10^{-5}
1,2,3,4,6,7,8 HPCDF	5.67×10^{-5}	NA
1,2,3,4,6,7,8 HPCDD	5.67×10^{-5}	NA
1,2,3,4,6,7,8,9 OCDD	5.67×10^{-4}	NA
2,3,7,8 TCDF	5.67×10^{-6}	NA
1,2,3,4,6,7,8 HXCDD	5.67×10^{-6}	NA
1,2,3,4,6,7,8,9 OCDF	5.67×10^{-4}	NA
Dieldrin	NA	NA
Aroclor 1242	NA	NA
Aroclor 1248	NA	NA
Aroclor 1254	NA	NA
Aroclor 1260	NA	NA
Inorganics		
Arsenic	11	50
Beryllium	0.02	4
Cadmium	NA	5
Copper	NA	1300
Iron	NA	NA
Lead	NA	15
Zinc	NA	NA
Cyanide	NA	200

NA - Not Applicable

Table 2-6
Groundwater Analytical Results - Summary of VOCs
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,4-DICHLORO-BENZENE	BENZENE	CHLOROFORM	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRANS-1,2-DICHLOROETHENE	TRICHLOROETHENE	VINYL CHLORIDE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	0 62	0 28	NA	6 22	NA	0 0677	3 03	0 0283
Compliance Level - MCL		75	5	NA	700	NA	1000	70	5	2
WP-EW-0803-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	3 2	(8 4)	(2)	ND	(30)	ND	ND	ND	ND
	Apr-97	ND	ND	(3)	ND	ND	ND	ND	ND	ND
	Jul-97	5	(11)	ND	1	(58)	2	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Nov-98	ND	(9 6 J)	ND	ND	(950=)	ND	ND	ND	ND
WP-EW-0807-GW10	Oct-96	ND	(27)	ND	33	ND	150	(2)	ND	ND
	Jan-97	2	(19)	ND	33	(29)	90	(2)	ND	ND
	Apr-97	1	(18)	ND	33	ND	98	(2)	ND	ND
	Jul-97	ND	(1)	ND	3	ND	ND	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-0812-GW10	Feb-89	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-89	ND	0 4	ND	ND	ND	ND	ND	ND	ND
	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(1)	ND	ND	(29)	ND	ND	ND	ND
	Apr-97	ND	(2)	ND	ND	ND	ND	ND	ND	16
	Jul-97	ND	(1)	ND	ND	ND	ND	ND	ND	ND
	Feb-98									
	Jun-98									
	Sep-98	ND	0 54	ND	ND	ND	ND	ND	ND	ND
	Nov-98	ND	ND	ND	ND	(420 =)	ND	ND	ND	ND
WP-EW-0816-GW10	Oct-96	ND	(4)	ND	ND	ND	ND	ND	ND	(21)
	Jan-97	ND	(4)	ND	3	(30)	ND	(2 6)	ND	(41)
	Apr-97	ND	(2)	ND	ND	ND	ND	ND	ND	(12)
	Jul-97	1	(2)	(2)	ND	ND	ND	ND	ND	(8)
	Feb-98	ND	(2 6)	ND	ND	(8 3)	ND	(2 3)	1 9	(24)
	Jun-98	ND	(4 6)	ND	ND	3 5	ND	(2 5)	ND	(49)
	Sep-98	ND	(3 0)	ND	ND	4 4	ND	(2 7)	2 0	(29)
	Nov-98	ND	(2 3 =)	ND	ND	(51 =)	ND	(1 8 J)	(1 7 J)	(18 =)
WP-EW-0816-GW105	Nov-98	ND	(2 9 =)	ND	ND	ND	ND	(2 2 =)	1 9 J	(24 =)

Table 2-7
Groundwater Analytical Results - Summary of SVOCs
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	4-METHYL-PHENOL	BENZO(A) PYRENE	DIETHYL PHTHALATE	NAPHTHALENE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA
Compliance Level - MCL		NA	0 2	NA	NA
WP-EW-0803-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Nov-98	ND	ND	ND	16 JB
WP-EW-0807-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	320	ND	ND	13
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-0812-GW10	Feb-89				
	Jun-89				
	Oct-96	ND	ND	ND	ND
	Jan-97	320	ND	ND	13
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Nov-98	ND	ND	ND	ND
WP-EW-0816-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Nov-98	ND	ND	ND	ND
WP-EW-0816-GW105	Nov-98	ND	ND	ND	ND

Table 2-8
Groundwater Analytical Results - Summary of Dioxin Compounds
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,2,3 4,6,7,8-HPCDD	1,2,3,4 6,7,8-HPCDF	1,2,3,4,7,8-HXCDF	1,2,3,6,7,8-HXCDF	2,3,4,7,8-PECDF	2,3,7,8-TCDD	2,3,7,8-TCDF	DIOXIN	OCDD	OCDF
Units		(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)
Compliance Level - ROD		56 7	56 7	NA	NA	NA	0 567	5 67	0 567	5 67	5 67
Compliance Level - MCL		NA	NA	NA	NA	NA	30	NA	30	NA	NA
WP-EW-0803-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Nov-98	3 0 J	2 0 JQ	ND	ND	ND	ND	ND		(53 JB)	4 J
WP-EW-0807-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
WP-EW-0812-GW10	Feb-89										
	Jun-89										
	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Nov-98	8 0 J	2 5 J	ND	ND	ND	ND	ND		(120 B)	12 J
WP-EW-0816-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Nov-98	ND	ND	ND	ND	ND	ND	ND		1 75 JQB	ND
WP-EW-0816-GW105	Nov-98	ND	ND	ND	ND	ND	ND	ND		3 6 JQB	ND

Table 2-9
Groundwater Analytical Results - Summary of Pesticides/PCBs
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	AROCLOR 1016	AROCLOR 1221	AROCLOR 1232	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	DIELDRIN
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		NA	NA	NA	NA	NA	NA	NA	NA
WP-EW-0803-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-0807-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-0812-GW10	Feb-89								
	Jun-89								
	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-0816-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-0816-GW105	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND

Table 2-10
Groundwater Analytical Results - Summary of Inorganic Compounds
Extraction Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	ARSENIC	BERYLLIUM	CADMIUM	COPPER	CYANIDE	IRON	LEAD	ZINC
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		11	0 02	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		50	4	5	1,300	200	NA	15	NA
WP-EW-0803-GW10	Oct-96	ND	ND	0 2	ND	ND	59,300	ND	ND
	Jan-97	ND	ND	0 3	ND	ND	21,400	6	63
	Apr-97	(53)	ND	0 8	ND	ND	66,500	ND	ND
	Jul-97	ND	ND	ND	ND	ND	17,300	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Nov-98	ND	ND	ND	ND	16 =	18,200 MBB	ND	53 MBD
WP-EW-0807-GW10	Oct-96	(213)	ND	0 6	ND	ND	802,000	11	3,010
	Jan-97	(89)	ND	0 9	ND	ND	46,000	(26)	420
	Apr-97	(112)	ND	0 3	ND	ND	471,000	ND	ND
	Jul-97	(69)	ND	0 4	ND	ND	208,000	13	1,360
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-0812-GW10	Feb-89								
	Jun-89								
	Oct-96	ND	ND	ND	ND	ND	48,900	ND	ND
	Jan-97	ND	ND	ND	ND	ND	63,800	7	52
	Apr-97	ND	ND	ND	ND	ND	16,100	ND	ND
	Jul-97	ND	ND	ND	ND	ND	38,500	ND	ND
	Feb-98	8	ND	ND	ND	ND	4,300	ND	ND
	Jun-98	0 04	ND	ND	ND	NS	22	ND	ND
	Sep-98	0 03	ND	ND	ND	NS	13	ND	ND
	Nov-98	(410 =)	ND	ND	ND	ND	96,000 =	ND	ND
WP-EW-0816-GW10	Oct-96	ND	ND	ND	ND	ND	16,400	ND	ND
	Jan-97	(1,100)	ND	ND	ND	ND	23,000	ND	ND
	Apr-97	ND	ND	ND	ND	ND	2,610	ND	ND
	Jul-97	ND	ND	ND	ND	ND	7,630	ND	ND
	Feb-98	1	ND	ND	ND	ND	700	ND	ND
	Jun-98	0 24	ND	ND	ND	NS	87	ND	ND
	Sep-98	0 08	ND	ND	0 04	NS	36	0 031	0 05
	Nov-98	(260 =)	ND	ND	ND	ND	49,700 =	ND	ND
WP-EW-0816-GW105	Nov-98	(900 =)	ND	ND	ND	ND	166,000 =	ND	50 =

MBB - This analyte is present at a reportable level in the associated method blank, but is less than 5% of the sample amount
MBD - This analyte is present in the associated method blank at an amout that is less than two times the reporting limit

Table 2-11
Groundwater Analytical Results - Summary of VOCs
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,4-DICHLORO-BENZENE	BENZENE	CHLOROFORM	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRANS-1,2-DICHLOROETHENE	TRICHLOROETHENE	VINYL CHLORIDE
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Compliance Level - ROD		NA	0 62	0 28	NA	6 22	NA	0 0677	3 03	0 0283
Compliance Level - MCL		75	5	NA	700	NA	1000	70	5	2
WP-LF08-MW02A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	1 1 =	ND	ND	ND	ND
WP-LF08-MW02C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	1 2 =	ND	ND	ND	ND
WP-LF08-MW04A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 5 =	ND	ND	ND	ND
WP-LF08-MW04A-GW105	Oct-98	ND	ND	ND	ND	1 7 =	ND	ND	ND	ND
WP-LF08-MW04B-GW10	Oct-96	ND	(8)	ND	ND	ND	20	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 75 =	ND	ND	ND	ND
WP-LF08-MW06B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	(0 75)	ND	0 39	3 4 =	0 96	ND	ND	ND
WP-LF08-MW06C-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF08-MW09A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	(29)	ND	ND	ND	ND
	Oct-98	ND	(1 1 =)	ND	0 33 J	3 1 =	1 3 =	ND	ND	ND
WP-LF08-MW09B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	3 2	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW101-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	2 3 =	0 84 =	ND	ND	ND
WP-LF08-MW102-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	1 1 =	ND	ND	ND	ND
WP-LF08-MW103-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	0 91 =	ND	ND	ND	ND
WP-LF08-MW10A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 31 J	ND	ND	ND	ND
WP-LF08-MW10B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	(9)
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	(6 4)
	Oct-98	ND	ND	ND	ND	0 45 J	ND	ND	ND	(10 =)
WP-LF08-MW10C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	(6)
	Jan-97	ND	ND	ND	ND	(29)	ND	ND	ND	(3 6)
	Oct-98	ND	ND	ND	ND	ND	ND	(0 22 J)	ND	(4 4 =)
WP-LF08-02-003-M-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 83 =	ND	ND	ND	ND

Table 2-12
Groundwater Analytical Results - Summary of SVOCs
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	4-METHYL-PHENOL	BENZO(A) PYRENE	DIETHYL PHTHALATE	NAPHTHALENE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA
Compliance Level - MCL		NA	0 2	NA	NA
WP-LF08-MW02A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW02C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW04A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW04A-GW105	Oct-98	ND	ND	ND	ND
WP-LF08-MW04B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97				
	Oct-98	ND	ND	ND	ND
WP-LF08-MW04C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW06A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW06B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW06C-GW10	Jan-97	DRY	DRY	DRY	DRY
WP-LF08-MW09A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW09B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW101-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND
WP-LF08-MW102-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	0 5
WP-LF08-MW103-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND
WP-LF08-MW10A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW10B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-MW10C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF08-02-003-M-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND

Table 2-13
Groundwater Analytical Results - Summary of Dioxin Compounds
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,2,3,4,6,7,8-HPCDD	1,2,3,4,6,7,8-HPCDF	1,2,3,4,7,8-HXCDF	1,2,3,6,7,8-HXCDF	2,3,7,8-TCDD	2,3,7,8-TCDF	DIOXIN	OCDD	OCDF
Units		(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)
Compliance Level - ROD		56 7	56 7	NA	NA	0 567	5 67	0 567	567	567
Compliance Level - MCL		NA	NA	NA	NA	30	NA	30	NA	NA
WP-LF08-MW02A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		3 4 JQB	ND
WP-LF08-MW02C-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		2 4 JQB	ND
WP-LF08-MW04A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		ND	ND
WP-LF08-MW04A-GW105	Oct-98	ND	ND	ND	ND	ND	ND		ND	ND
WP-LF08-MW04B-GW10	Oct-96							ND		
	Jan-97									
	Oct-98	ND	ND	ND	ND	ND	ND		9 JB	ND
WP-LF08-MW04C-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	1 7 JQS	2 5 JQ	1 4 J	ND	ND	(5 7 JQ)		41 JB	7 8 J
WP-LF08-MW06A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		7 4 JQB	ND
WP-LF08-MW06B-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		24 JB	ND
WP-LF08-MW06C-GW10	Jan-97							DRY		
WP-LF08-MW09A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		2 7 JB	ND
WP-LF08-MW09B-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		3 3 JB	ND
WP-LF08-MW101-GW10	Oct-96							ND		
	Jan-97							ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	52	7 3	ND	ND	ND	ND		(1000 B)	44 J
WP-LF08-MW102-GW10	Oct-96							ND		
	Jan-97							ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	6 9 JQ	1 8 J	0 56 JQ	ND	ND	ND		110 B	6 3 J
WP-LF08-MW103-GW10	Oct-96							ND		
	Jan-97							ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	18 J	2 9	ND	ND	ND	ND		320 B	15 J
WP-LF08-MW10A-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		3 2 JB	ND
WP-LF08-MW10B-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		1 9 JBQ	ND
WP-LF08-MW10C-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		34 BJ	ND
WP-LF08-02-003-M-GW10	Oct-96							ND		
	Jan-97							ND		
	Oct-98	ND	ND	ND	ND	ND	ND		4 8 JB	ND

Table 2-14
Groundwater Analytical Results - Summary of Pesticides/PCBs
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	AROCLOR 1016	AROCLOR 1221	AROCLOR 1232	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	DIELDRIN
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		NA	NA	NA	NA	NA	NA	NA	NA
WP-LF08-MW02A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW02C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04A-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW04C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06C-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
WP-LF08-MW09A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW09B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW101-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW102-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW103-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW10A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW10B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW10C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-02-003-M-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND

Table 2-15
Groundwater Analytical Results - Summary of Inorganic Compounds
Monitoring Wells - Landfill 8
Wright-Patterson AFB, Ohio

LOCATION	DATE	ARSENIC	BERYLLIUM	CADMIUM	COPPER	CYANIDE	IRON	LEAD	ZINC
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		11	0 02	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		50	4	5	1,300	200	NA	15	NA
WP-LF08-MW02A-GW10	Oct-96	ND	ND	1	ND	ND	21,700	(22)	63
	Jan-97	ND	ND	ND	60	ND	30	9	70
	Oct-98	ND	ND	ND	ND	ND	4400 =	ND	53 =
WP-LF08-MW02C-GW10	Oct-96	ND	ND	ND	ND	ND	10,700	6	ND
	Jan-97	(50)	ND	ND	50	ND	44,000	(21)	120
	Oct-98	(14 =)	ND	ND	ND	ND	4000 =	ND	ND
WP-LF08-MW04A-GW10	Oct-96	ND	ND	ND	ND	ND	3,670	ND	ND
	Jan-97	(30)	ND	ND	ND	ND	3,300	ND	ND
	Oct-98	(22 =)	ND	ND	ND	ND	1400 =	ND	ND
WP-LF08-MW04A-GW105	Oct-98	(23 =)	ND	ND	ND	ND	1300 =	ND	ND
WP-LF08-MW04B-GW10	Oct-96	ND	ND	ND	ND	ND	8,490	8	ND
	Jan-97	10	ND	ND	(5,400)	ND	8,300	ND	ND
	Oct-98	(18 =)	ND	ND	ND	ND	1200 =	ND	ND
WP-LF08-MW04C-GW10	Oct-96	ND	ND	0 4	ND	ND	19,000	(25)	77
	Jan-97	ND	ND	ND	20	ND	8,300	(400)	30
	Oct-98	ND	ND	ND	ND	ND	1700 =	ND	ND
WP-LF08-MW06A-GW10	Oct-96	ND	ND	ND	ND	ND	2,200	ND	ND
	Jan-97	ND	ND	ND	20	ND	3,500	ND	ND
	Oct-98	ND	ND	ND	ND	ND	220 =	ND	ND
WP-LF08-MW06B-GW10	Oct-96	ND	ND	0 3	ND	ND	978	ND	ND
	Jan-97	10	ND	ND	ND	ND	3,100	ND	ND
	Oct-98	(49 =)	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW06C-GW10	Jan-97	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
WP-LF08-MW09A-GW10	Oct-96	ND	ND	ND	ND	ND	418	ND	ND
	Jan-97	ND	ND	ND	20	ND	18,000	6	30
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF08-MW09B-GW10	Oct-96	ND	ND	ND	ND	ND	3,520	7	ND
	Jan-97	ND	ND	ND	10	ND	12,000	4	50
	Oct-98	ND	ND	ND	ND	ND	270 =	ND	ND
WP-LF08-MW101-GW10	Oct-96	ND	ND	0 4	ND	ND	6,210	(17)	62
	Jan-97	ND	(7)	ND	ND	ND	54,000	ND	180
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	10 =	ND	ND	26 =	ND	15200 =	26 =	100 =
WP-LF08-MW102-GW10	Oct-96	(61)	(3)	2	164	ND	115,000	(86)	396
	Jan-97	(40)	ND	ND	30	ND	30,000	(17)	90
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	11 =	ND	ND	ND	ND	6200 =	ND	ND
WP-LF08-MW103-GW10	Oct-96	ND	(1)	3	106	ND	56,200	(49)	258
	Jan-97	(50)	ND	ND	50	ND	44,000	(21)	120
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	(13 =)	ND	ND	ND	ND	9000 =	5 1 =	70 =
WP-LF08-MW10A-GW10	Oct-96	ND	ND	0 3	ND	ND	4,610	8	ND
	Jan-97	(30)	ND	ND	ND	ND	6,700	ND	ND
	Oct-98	(25 =)	ND	ND	ND	ND	2300 =	ND	ND
WP-LF08-MW10B-GW10	Oct-96	ND	ND	ND	ND	ND	1,670	ND	ND
	Jan-97	ND	ND	ND	ND	ND	1,400	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1600 =	ND	ND
WP-LF08-MW10C-GW10	Oct-96	(128)	(1)	1 1	82	ND	75,900	(24)	288
	Jan-97	(770)	ND	ND	270	ND	370,000	(80)	590
	Oct-98	(110 =)	ND	ND	67 =	ND	53000 =	(19 =)	230 =
WP-LF08-02-003-M-GW10	Oct-96	ND	ND	0 3	ND	ND	896	5	ND
	Jan-97	(20)	ND	ND	ND	ND	4,000	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1800 =	ND	ND

Table 2-16
Groundwater Analytical Results - Summary of VOCs
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,4-DICHLORO-BENZENE	BENZENE	CHLOROFORM	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRANS-1,2-DICHLOROETHENE	TRICHLOROETHENE	VINYL CHLORIDE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	0 62	0 28	NA	6 22	NA	0 0677	3 03	0 0283
Compliance Level - MCL		75	5	NA	700	NA	1000	70	5	2
WP-EW-1001-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2)	ND	11	(9 5)	ND	ND	ND	ND
	Apr-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-97	ND	(1)	(4)	3	ND	ND	ND	ND	ND
	Feb-98	ND	0 37	ND	ND	ND	ND	ND	ND	ND
	Jun-98	ND	0 4	ND	ND	ND	ND	ND	ND	ND
	Sep-98	ND	0 03	ND	1 2	ND	ND	ND	ND	ND
	Oct-98	ND	(1 6 =)	ND	2 5 =	0 27 J	ND	ND	ND	ND
WP-EW-1003-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2 4)	ND	ND	25	ND	ND	ND	ND
	Apr-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-97	ND	ND	(2)	ND	ND	ND	ND	ND	ND
	Feb-98	ND	(0 84)	ND	ND	ND	ND	ND	ND	ND
	Jun-98	ND	(1)	ND	ND	ND	ND	ND	ND	ND
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96	ND	(5)	ND	4	ND	3	ND	ND	ND
	Jan-97	ND	(3)	ND	ND	ND	ND	ND	ND	(2)
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	ND	(1 1)	ND	ND	ND	0 42	ND	ND	ND
	Jun-98	ND	(0 85)	ND	0 33	0 31	0 56	ND	ND	ND
	Sep-98	ND	(1 4)	ND	0 45	ND	0 27	ND	ND	ND
	Oct-98	ND	(0 67 =)	ND	ND	ND	0 52 =	ND	ND	(0 69 =)
WP-EW-1015-GW10	Oct-96	ND	(10)	ND	29	ND	4	ND	ND	ND
	Jan-97	9	(13)	ND	45	4 6	14	ND	ND	2
	Apr-97	5	(11)	ND	32	ND	2	(3)	ND	ND
	Jul-97	3	(10)	(3)	23	ND	1	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1019-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2)	ND	ND	ND	ND	ND	ND	ND
	Apr-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-97	ND	(1)	ND	1	ND	ND	ND	ND	ND
	Feb-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jun-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sep-98	ND	(0 87)	ND	1 84	ND	ND	ND	ND	ND
WP-EW-1019-Duplicate	Sep-98	ND	(0 86)	ND	1 9	ND	ND	ND	ND	ND
	Nov-98	ND	(1 5 =)	ND	ND	(45 =)	ND	ND	ND	ND
WP-EW-1020-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2)	ND	ND	ND	2	ND	ND	ND
	Jul-97	ND	ND	(21)	1	ND	1	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(1)	ND	2	ND	6	ND	ND	ND
	Apr-97	ND	ND	ND	ND	ND	2	ND	ND	ND
	Jul-97	1	(1)	(2)	4	ND	9	ND	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	4 4 =	ND	ND	ND	ND
WP-EW-1025-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY

Table 2-17
Groundwater Analytical Results - Summary of SVOCs
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	4-METHYL-PHENOL	BENZO(A) PYRENE	DIETHYL PHTHALATE	NAPHTHALENE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA
Compliance Level - MCL		NA	0 2	NA	NA
WP-EW-1001-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Oct-98	ND	ND	ND	0 86 =
WP-EW-1003-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	DRY	DRY	DRY	DRY
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97	DRY	DRY	DRY	DRY
	Feb-98				
	Jun-98				
	Sep-98				
	Oct-98	ND	ND	ND	ND
WP-EW-1015-GW10	Oct-96	ND	ND	200	ND
	Jan-97	ND	ND	ND	15
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-1019-GW10 *	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Nov-98	DRY	DRY	DRY	DRY
WP-EW-1020-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	DRY	DRY	DRY	DRY
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	DRY	DRY	DRY	DRY
	Apr-97				
	Jul-97				
	Feb-98				
	Jun-98				
	Sep-98				
	Oct-98	ND	ND	ND	ND
WP-EW-1025-GW10	Jan-97	DRY	DRY	DRY	DRY
	Feb-98				
	Jun-98				
	Sep-98	DRY	DRY	DRY	DRY

* - Well went dry during sampling Only VOCs and Dioxins were taken

Table 2-18
Groundwater Analytical Results - Summary of Dioxin Compounds
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,2,3,4,6,7,8-HPCDD	1,2,3,4,6,7,8-HPCDF	1,2,3,4,7,8-HXCDF	1,2,3,6,7,8-HXCDF	2,3,4,7,8-PECDF	2,3,7,8-TCDD	2,3,7,8-TCDF	DIOXIN	OCDD	OCDF
Units		(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)	(pg/L)
Compliance Level - ROD		56 7	56 7	NA	NA	NA	0 567	5 67	0 567	5 67	5 67
Compliance Level - MCL		NA	NA	NA	NA	NA	30	NA	30	NA	NA
WP-EW-1001-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Oct-98	ND	ND	ND	ND	ND	ND	ND		ND	ND
WP-EW-1003-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96								ND		
	Jan-97								DRY		
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97								DRY		
	Feb-98										
	Jun-98										
	Sep-98										
	Oct-98	ND	ND	ND	ND	ND	ND	ND		0 58 JQB	ND
WP-EW-1015-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1019-GW10	Oct-96								ND		
	Jan-97								ND		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Nov-98	ND	ND	ND	ND	ND	ND	ND		2 7 JB	ND
WP-EW-1020-GW10	Oct-96								ND		
	Jan-97								DRY		
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96								ND		
	Jan-97								DRY		
	Apr-97										
	Jul-97										
	Feb-98										
	Jun-98										
	Sep-98										
	Oct-98	ND	ND	ND	ND	ND	ND	ND		0 92 JBQ	ND
WP-EW-1025-GW10	Jan-97								DRY		
	Feb-98										
	Jun-98										
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY

Table 2-19
Groundwater Analytical Results - Summary of Pesticides/PCBs
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	AROCLOR 1016	AROCLOR 1221	AROCLOR 1232	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	DIELDRIN
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		NA	NA	NA	NA	NA	NA	NA	NA
WP-EW-1001-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-1003-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				DRY	DRY	DRY	DRY	DRY
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
	Feb-98								
	Jun-98								
	Sep-98								
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-1015-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1019-GW10 *	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Nov-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1020-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				DRY	DRY	DRY	DRY	DRY
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				DRY	DRY	DRY	DRY	DRY
	Apr-97								
	Jul-97								
	Feb-98								
	Jun-98								
	Sep-98								
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-1025-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
	Feb-98								
	Jun-98								
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY

* - Well went dry Only VOCs and Dioxins were collected

Table 2-20
Groundwater Analytical Results - Summary of Inorganic Compounds
Extraction Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	ARSENIC	BERYLLIUM	CADMIUM	COPPER	CYANIDE	IRON	LEAD	ZINC
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		11	0 02	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		50	4	5	1,300	200	NA	15	NA
WP-EW-1001-GW10	Oct-96	(163)	ND	ND	ND	ND	50,200	ND	ND
	Jan-97	(50)	ND	ND	ND	ND	26,000	ND	55
	Apr-97	ND	ND	ND	ND	ND	11,100	ND	ND
	Jul-97	(117)	ND	ND	ND	ND	13,700	ND	ND
	Feb-98	3	ND	ND	ND	ND	1,800	ND	ND
	Jun-98	1 2	ND	ND	ND	NS	190	ND	ND
	Sep-98	0 06	ND	ND	ND	NS	27	ND	ND
	Oct-98	(54 =)	ND	ND	ND	ND	37600 =	ND	ND
WP-EW-1003-GW10	Oct-96	ND	ND	0 4	ND	ND	10,200	ND	ND
	Jan-97	(40)	ND	ND	ND	ND	39,000	ND	55
	Apr-97	ND	ND	ND	ND	ND	23,100	(83)	ND
	Jul-97	(66)	ND	ND	ND	ND	43,000	6	ND
	Feb-98	3	ND	ND	ND	ND	1,700	ND	ND
	Jun-98	0 21	ND	ND	ND	NS	120	ND	ND
	Sep-98	DRY	DRY	DRY	DRY	NS	DRY	DRY	DRY
WP-EW-1008-GW10	Oct-96	ND	ND	0 2	ND	ND	73,800	ND	ND
	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1012-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	(16)	ND	ND	ND	ND	10,000	ND	ND
	Jun-98	0 27	ND	ND	ND	NS	84	ND	0 03
	Sep-98	0 08	ND	ND	ND	NS	46	ND	0 21
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-EW-1015-GW10	Oct-96	ND	ND	0 7	ND	ND	61,400	9	67
	Jan-97	ND	ND	ND	ND	ND	43,200	ND	ND
	Apr-97								
	Jul-97	ND	ND	ND	ND	ND	40,500	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1019-GW10 *	Oct-96	ND	ND	0 3	ND	ND	5,330	ND	ND
	Jan-97	ND	ND	ND	ND	ND	3,060	ND	ND
	Apr-97	ND	ND	ND	ND	ND	1,040	ND	ND
	Jul-97	ND	ND	ND	ND	ND	12,400	ND	ND
	Feb-98	ND	ND	ND	ND	ND	1	ND	ND
	Jun-98	ND	ND	ND	ND	NS	2	ND	ND
	Sep-98	0 01	ND	ND	0 02	NS	10	ND	0 03
WP-EW-1019 Duplicate	Sep-98	0 01	ND	ND	0 03	NS	11	0 032	ND
	Nov-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1020-GW10	Oct-96	ND	ND	ND	ND	ND	8,070	6	ND
	Jan-97	ND	ND	ND	ND	ND	7,020	ND	ND
	Jul-97	ND	ND	ND	ND	ND	15,900	ND	66
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-EW-1024-GW10	Oct-96	ND	ND	ND	ND	ND	27,200	ND	ND
	Jan-97	ND	ND	ND	ND	ND	15,000	ND	ND
	Apr-97	ND	ND	0 2	ND	ND	5,310	ND	ND
	Jul-97	ND	ND	ND	ND	ND	9,770	ND	ND
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	(27 =)	ND	ND	ND	ND	48700 =	ND	ND
WP-EW-1025-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Feb-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY

* - Well went dry Samples collected included VOCs and Dioxins

Table 2-21
Groundwater Analytical Results - Summary of VOCs
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	1 4-DICHLORO-BENZENE	BENZENE	CHLOROFORM	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRANS-1,2-DICHLOROETHENE	TRICHLOROETHENE	VINYL CHLORIDE
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Compliance Level - ROD		NA	0 62	0 28	NA	6 22	NA	0 0677	3 03	0 0283
Compliance Level - MCL		75	5	NA	700	NA	1000	70	5	2
WP-LF10-MW04A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	27	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 56 =	ND	ND	ND	ND
WP-LF10-MW04B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	25	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 69 =	ND	ND	ND	ND
WP-LF10-MW04C-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW05B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	25	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	1 2 =	ND	ND	0 29 J	ND
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND	1 8 =	ND	ND	ND	ND
WP-LF10-MW05C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	4 2	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	2 3 =	ND	ND	ND	ND
WP-LF10-MW06A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2)	ND	ND	11	3 2	ND	ND	ND
	Oct-98	ND	0 55 =	ND	ND	ND	0 74 =	ND	ND	ND
WP-LF10-MW06B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	3 8	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 73 =	ND	ND	1 2 =	(4 2 =)
WP-LF10-MW08A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	3 8	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 47 J	ND	ND	ND	ND
WP-LF10-MW08B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	2 7	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 41 J	ND	ND	ND	ND
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	5 4	ND	ND	ND	ND
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	(1 =)	ND	ND	0 41 J	ND	ND	ND	ND
WP-LF10-MW09C-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2 9)	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	(3 2 =)	ND	ND	0 28 J	ND	ND	ND	ND
WP-LF10-MW102-GW10	Jan-97									
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW103-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	(2 7)	ND	ND	2 5	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	(1 5 =)	ND	ND	1 5 =	ND	ND	ND	ND
WP-LF10-MW104-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW105-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	3 8	55	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	1 2 =	ND	ND	ND	ND
WP-LF10-MW11A-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	0 74 =	ND	ND	ND	ND
WP-LF10-MW11A-GW105	Oct-98	ND	ND	ND	ND	0 91 =	ND	ND	ND	ND
WP-LF10-MW11B-GW10	Oct-96	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	2 8 =	ND	ND	ND	ND

Table 2-22
Groundwater Analytical Results - Summary of SVOCs
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	4-METHYL-PHENOL	BENZO(A) PYRENE	DIETHYL PHTHALATE	NAPHTHALENE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA
Compliance Level - MCL		NA	0 2	NA	NA
WP-LF10-MW04A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW04B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW04C-GW10	Jan-97	DRY	DRY	DRY	DRY
WP-LF10-MW05B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	0 81
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND
WP-LF10-MW05C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW06A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW06B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW08A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW08B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND
WP-LF10-MW09A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Nov-98	ND	ND	ND	ND
WP-LF10-MW09B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW09C-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW102-GW10	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98				ND
WP-LF10-MW103-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND
WP-LF10-MW104-GW10	Jan-97	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
WP-LF10-MW105-GW10	Oct-96	ND	ND	ND	ND
	Jan-97				
	Jun-98	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND
WP-LF10-MW11A-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND
WP-LF10-MW11A-GW105	Oct-98	ND	ND	ND	ND
WP-LF10-MW11B-GW10	Oct-96	ND	ND	ND	ND
	Jan-97	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND

Table 2-23
Groundwater Analytical Results - Summary of Dioxin Compounds
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	1,2,3,4,6,7,8-HPCDD	1,2,3,4,6,7,8-HPCDF	1,2,3,4 7,8-HXCDF	1 2,3,6,7,8-HXCDF	2,3,4,7,8-PECDF	2,3,7,8-TCDD	2,3,7,8-TCDF	DIOXIN	OCDD	OCDF
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		56 7	56 7	NA	NA	NA	0 567	5 67	0 567	567	567
Compliance Level - MCL		NA	NA	NA	NA	NA	30	NA	30	NA	NA
WP-LF10-MW04A-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		4 JQB	ND
WP-LF10-MW04A-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	4	ND
WP-LF10-MW04B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		15 JB	ND
WP-LF10-MW04B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	15	ND
WP-LF10-MW04C-GW10	Jan-97								DRY		
WP-LF10-MW04C-GW10 Total									DRY		
WP-LF10-MW05B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		1 8 JBQ	ND
WP-LF10-MW05B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	1 8	ND
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND		3 8 JQB	ND
WP-LF10-MW05B-GW105 Total		ND	ND	ND	ND	ND	ND	ND		3 8	ND
WP-LF10-MW05C-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	5 3 J	5 8 J	ND	ND	ND		18 JB	10 J
WP-LF10-MW05C-GW10 Total		ND	ND	5 3	5 8	ND	ND	ND	ND	18	10
WP-LF10-MW06A-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	10 JQS	ND	ND	ND	ND	ND	ND		220 JB	ND
WP-LF10-MW06A-GW10 Total		10	ND	ND	ND	ND	ND	ND	ND	220	ND
WP-LF10-MW06B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		2 5 JB	ND
WP-LF10-MW06B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	2 5	ND
WP-LF10-MW08A-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		6 8 JB	ND
WP-LF10-MW08A-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	6 8	ND
WP-LF10-MW08B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		ND	ND
WP-LF10-MW08B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND		3 3 JB	ND
WP-LF10-MW08B-GW105 Total		ND	ND	ND	ND	ND	ND	ND		3 3	ND
WP-LF10-MW09A-GW10	Oct-96								ND		
	Jan-97								ND		
	Nov-98	ND	ND	ND	ND	ND	ND	ND		2 4	ND
WP-LF10-MW09A-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	2 4	ND
WP-LF10-MW09B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		2 6 JBQ	ND
WP-LF10-MW09B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	2 6	ND
WP-LF10-MW09C-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		ND	ND
WP-LF10-MW09C-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW102-GW10	Jan-97								ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND		18 JB	ND
WP-LF10-MW102-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	18	ND
WP-LF10-MW103-GW10	Oct-96								ND		
	Jan-97								ND		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS		NS	NS
WP-LF10-MW103-GW10 Total									ND		
WP-LF10-MW104-GW10	Jan-97								DRY		
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
WP-LF10-MW104-GW10 Total									DRY		
WP-LF10-MW105-GW10	Oct-96								ND		
	Jan-97										
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY		DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND		3 1 JBQ	ND
WP-LF10-MW105-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	3 1	ND
WP-LF10-MW11A-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	1 5 J	ND	ND	ND	ND	ND	ND		12 JB	1 1 JQ
WP-LF10-MW11A-GW10 Total		1 5	ND	ND	ND	ND	ND	ND	ND	12	1 1
WP-LF10-MW11A-GW105	Oct-98	4 7 JQS	ND	ND	ND	ND	(3 8 J)	ND		74 JB	2 4 J
WP-LF10-MW11A-GW105 Total		4 7	ND	ND	ND	ND	3 8	ND		74	2 4
WP-LF10-MW11B-GW10	Oct-96								ND		
	Jan-97								ND		
	Oct-98	ND	ND	ND	ND	ND	ND	ND		3 6 JB	ND
WP-LF10-MW11B-GW10 Total		ND	ND	ND	ND	ND	ND	ND	ND	3 6	ND

Table 2-24
Groundwater Analytical Results - Summary of Pesticides/PCBs
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	AROCLOR 1016	AROCLOR 1221	AROCLOR 1232	AROCLOR 1242	AROCLOR 1248	AROCLOR 1254	AROCLOR 1260	DIELDRIN
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		NA	NA	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		NA	NA	NA	NA	NA	NA	NA	NA
WP-LF10-MW04A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW04B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW04C-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
WP-LF10-MW05B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW05C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW06A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW06B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW08A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW08B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Nov-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW09C-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW102-GW10	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW103-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW104-GW10	Jan-97				DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW105-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW11A-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW11A-GW105	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND
WP-LF10-MW11B-GW10	Oct-96				ND	ND	ND	ND	ND
	Jan-97				ND	ND	ND	ND	ND
	Oct-98	ND	ND	ND	ND	ND	ND	ND	ND

Table 2-25
Groundwater Analytical Results - Summary of Inorganic Compounds
Monitoring Wells - Landfill 10
Wright-Patterson AFB, Ohio

LOCATION	DATE	ARSENIC	BERYLLIUM	CADMIUM	COPPER	CYANIDE	IRON	LEAD	ZINC
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Compliance Level - ROD		11	0 02	NA	NA	NA	NA	NA	NA
Compliance Level - MCL		50	4	5	1,300	200	NA	15	NA
WP-LF10-MW04A-GW10	Oct-96	ND	ND	0 4	119	ND	4,850	(24)	98
	Jan-97	ND	ND	ND	ND	ND	700	ND	ND
	Oct-98	ND	ND	ND	ND	ND	2500 =	ND	ND
WP-LF10-MW04B-GW10	Oct-96	ND	ND	0 3	ND	ND	5,730	13	ND
	Jan-97	ND	ND	ND	ND	ND	4,300	4	ND
	Oct-98	(15 =)	ND	ND	ND	ND	16000 =	ND	ND
WP-LF10-MW04C-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW05B-GW10	Oct-96								
	Jan-97	ND	ND	ND	ND	ND	500	ND	ND
	Oct-98	ND	ND	ND	ND	ND	390 =	ND	ND
WP-LF10-MW05B-GW105	Oct-98	ND	ND	ND	ND	ND	430	ND	ND
WP-LF10-MW05C-GW10	Oct-96								
	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW06A-GW10	Oct-96	ND	ND	0 8	ND	ND	7,060	15	ND
	Jan-97	ND	ND	ND	ND	ND	1,700	ND	ND
	Oct-98	ND	ND	ND	ND	ND	190 =	ND	ND
WP-LF10-MW06B-GW10	Oct-96	ND	ND	ND	ND	ND	1,020	ND	86
	Jan-97	ND	ND	ND	ND	ND	900	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1400 =	ND	ND
WP-LF10-MW08A-GW10	Oct-96								
	Jan-97	ND	ND	ND	ND	ND	10,000	5	ND
	Oct-98	ND	ND	ND	ND	ND	1200 =	ND	ND
WP-LF10-MW08B-GW10	Oct-96	(232)	(2)	3 3	67	ND	99,000	(50)	331
	Jan-97	(50)	ND	ND	30	ND	41,000	(24)	110
	Oct-98	ND	ND	ND	ND	ND	360 =	ND	52 =
WP-LF10-MW08B-GW105	Oct-98	ND	ND	ND	ND	ND	360 =	ND	ND
WP-LF10-MW09A-GW10	Oct-96	ND	ND	ND	ND	ND	2,550	6	ND
	Jan-97	ND	ND	ND	ND	ND	2,500	ND	ND
	Nov-98	ND	ND	ND	ND	ND	2,700	ND	ND
WP-LF10-MW09B-GW10	Oct-96	ND	ND	ND	ND	ND	2,550	6	ND
	Jan-97	10	ND	ND	ND	ND	7,500	ND	ND
	Oct-98	(13)	ND	ND	ND	ND	7500 =	ND	ND
WP-LF10-MW09C-GW10	Oct-96	ND	(1)	0 9	68	ND	67,300	(48)	263
	Jan-97	10	ND	ND	ND	ND	30,000	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1500 =	ND	ND
WP-LF10-MW102-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW103-GW10	Oct-96	(273)	(10)	ND	631	ND	407,000	(233)	1460
	Jan-97	(70)	ND	ND	20	ND	27,000	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW104-GW10	Jan-97	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
WP-LF10-MW105-GW10	Oct-96	ND	ND	ND	ND	ND	1,310	ND	ND
	Jan-97	ND	ND	ND	20	ND	4,100	ND	ND
	Jun-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Sep-98	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
	Oct-98	NS	NS	NS	NS	NS	NS	NS	NS
WP-LF10-MW11A-GW10	Oct-96	ND	ND	ND	ND	ND	1,760	ND	ND
	Jan-97	ND	ND	ND	ND	ND	2,600	ND	ND
	Oct-98	ND	ND	ND	ND	ND	1100 =	ND	ND
WP-LF10-MW11A-GW105	Oct-98	ND	ND	ND	ND	ND	1,100	ND	ND
WP-LF10-MW11B-GW10	Oct-96	ND	ND	ND	ND	ND	12,100	12	58
	Jan-97	10	ND	ND	20	ND	22,000	13	60
	Oct-98	ND	ND	ND	ND	ND	2900 =	ND	300 =

Table 2-26
Field Measurements
Explosive Gas Montoring - Landfill 8
Quarterly Status Report: Oct - Dec 1998
Wright-Patterson Air Force Base

Location	Probe Press. (2) (in. of Hg)	GW Depth (ft, TOC)	Probe Oxygen (%)	(% Methane/% LEL) Initial (3)	Sustained (4)	Methane TLV (5)	Monitoring Utility Line(s)	Distance/Direction From Nearest Probe/Structure	Comments
Landfill 8									
LF08-MP001	29 0	Dry	10.5	0/0	--	0.11	Unknown	91 ft. West	
LF08-MP002	28.8	Would Not Open [6]	14.0	0/0	--	0.19	Unknown	150 ft. West	
LF08-MP003	29.0	8.57	18.9	0/0	--	0.25	Unknown	200 ft. West	
LF08-MP004	28.9	Would Not Open [6]	16 0	0/0	--	0.23	Unknown	160 ft West	
LF08-MP006	28.9	Would Not Open [6]	19.7	0/0	--	0.05	Unknown	39 ft. South	
LF08-MP007	Could not enter yard					0.06	Unknown	50 ft. North	Not Accessible
LF08-MP008	29.0	Would Not Open [6]	6.7	0.5/10	0/0	0.02	Unknown	17 ft. North	
LF08-MP009	29.0	Would Not Open [6]	5.7	0/0	--	0.03	Unknown	20 ft North	
LF08-MP010	29.1	Dry	2.0	6.4/128	5.8/116	0.03	Unknown	22 ft. North	
LF08-MP011	29.1	Would Not Open [6]	1.7	0/0	--	0.02	Unknown	17 ft. North	
LF08-MP012	29.1	Would Not Open [6]	2.9	0/0	--	0.02	Unknown	13 ft. North	
LF08-MP013	29.1	Would Not Open [6]	19.4	0/0	--	0 03	Unknown	20 ft. South	No press. fitting
LF08-PT003	29.0	NA	19.9	0/0	--	0.02	Unknown	12 ft. North	

Notes.
1. Abbreviations in. = inches, ft,bgs = feet below ground surface, TLV = threshold limit value (see Note 6), N/A = not available, GBT = gas barrier trench, N = north, S = south
2 Pressure readings taken via pressure valve in unvented cap at top of probe
3. Initial gas concentrations reading taken after purging probe a minimum of 30 seconds
4 Sustained combustible gas concentration reading taken approximately one hour after removing unvented lid from monitoring probe
5 Methane TLV was calculated using the formula T = (0 00125)(H), where T = threshold limit value, H = horizontal distance in feet between probe and closest occupied structure
6 NT = GW Depth not taken because the inner probe cap would not open due to rust or damage.

Table 2-27
Field Measurements
Explosive Gas Montoring - Landfill 10
Quarterly Status Report: Oct - Dec 1998
Wright-Patterson AFB, Ohio

Location	Probe Press. (2) (in. of Hg)	GW Depth (ft, TOC)	Probe Oxygen (%)	(% Methane/% LEL) Initial (3)	Sustained (4)	Methane TLV (5)	Monitoring Utility Line(s)	Distance/Direction From Nearest Probe/Structure	Comments
Landfill 10									
LF10-MP014	29.0	Dry	11.0	0/0	--	0.04	Unknown	30 ft. Northwest	
LF10-MP016	See Note 7					0.11	Unknown	87 ft. Southeast	No press. fitting
LF10-MP018	Probe Not Found	--	--	--	--	0.08	Unknown	61 ft North	Not found
LF10-MP019	29 1	Dry	19.4	0/0	--	0.03	Unknown	25 ft. West	
LF10-MP020	29.1	Dry	7.2	0/0	--	0.02	Unknown	18 ft. East	
LF10-MP021	29.1	Dry	18.3	0/0	--	0.02	Unknown	17 ft. East	
LF10-MP023	29.1	Would Not Open [6]	20.1	0/0	--	0.02	Unknown	15 ft. Southeast	
LF10-MP026	29.1	3.97	18.7	0/0	--	0.02	Unknown	18 ft. East	
PT030	28.2	NA	19.4	0/0	--	0.09	Cable TV	70 ft. East	
PT031	28.2	NA	18.7	0/0	--	0.09	Cable TV	70 ft. East	
PT035	29.1	NA	19.7	0/0	--	0.08	Cable TV	66 ft. East	
PT036	29.1	NA	19.8	0/0	--	0.09	Cable TV	69 ft. East	
PT060	28.2	NA	20.6	0/0	--	0.08	Unknown	65 ft. East	
PT065	28.2	NA	20.5	0/0	--	0.09	Unknown	69 ft. East	
PT078	28.2	NA	19.3	0/0	--	0.05	Sewer	39 ft. Northeast	
PT085	28.2	NA	13.7	0/0	--	0.08	Sewer/Electric	60 ft. Soutwest	
PT088	28.3	NA	19.3	0/0	--	0.02	Gas	14 ft. Northeast	
PT090	28.2	NA	17.9	0/0	--	0.24	Gas	196 ft. Southeast	
PT091	28.3	NA	19.3	0/0	--	0.28	Sewer	225 ft. Southeast	
PT093	28.4	NA	20.5	0/0	--	0.38	Sewer	225 ft. Southeast	
PT095	28.4	NA	20.4	0/0	--	0.38	Sewer	300 ft. North	
PT100	28.4	NA	18.7	0/0	--	0.44	Sewer	350 ft. Southeast	
LF10-GBT0S	28.3	Dry	1.3	26.1/522	--	0.09	GBT-S	75 ft. Southeast	
LF10-GBT0N	28.2	Dry	0.0	0.3/6	--	--	GBT-N	39 ft. East	

Notes:

1 Abbreviations in = inches, ft,bgs = feet below ground surface, TLV = threshold limit value (see Note 5), N/A = not available, GBT = gas barrier trench, N = north, S = south

2 Pressure readings taken via pressure valve in unvented cap at top of probe

3 Initial gas concentrations reading taken after purging probe a minimum of 30 seconds.

4 Sustained combustible gas concentration reading taken approximately one hour after removing unvented lid from monitoring probe

5 Methane TLV was calculated using the formula T = (0 00125)(H), where T = threshold limit value, H = horizontal distance in feet between probe and closest occupied structure

6. Inner probe caps were damaged or rusted shut and could not be opened to obtain a water sample

7. Pressure fitting missing, open tube filled with water

Table 2-28
LF8 Groundwater Levels (10/12/98)
Wright-Patterson AFB, Ohio

Well No.	Easting (ft.)	Northing (ft.)	Ref. Point Elevation (ft)	Well Depth (ft)	Screen Interval (ft)	GW Depth (ft) 10/12/98	GW Elevation (ft) 10/12/98
EW-0803	1557209	654410	936.73	55.5	5.0-55.5	50.81	885.92
EW-0805	1557238	654525	938.54	55.5	5.5-55.5	50.23	888.31
EW-0810	1557326	654916	930.69	55.0	5.0-55.5	24.57	906.12
EW-0812	1557334	655116	926.88	50.0	5.0-50.0	42.28	884.60
EW-0816	1557253	655198	932.99	55.0	5.0-55.0	54.56	878.43
02-003-M	1557617	655096	850.24	44.0	24.0-44.0	4.64	845.60
02-DM-82-M	1557459	654766	893.37	64.5	29.0 - 39.0	12.20	881.17
02-DM-83D-M	1557333	655331	912.56	72.7	37.1-47.1	14.80	897.76
02-DM-83S-M	1557327	655335	913.32	17.0	12-17	18.12	895.20
02-DM-84-M	1557463	654745	914.49	57.8	28.0 - 33.0	20.58	893.91
02-DM-85-M	1557384	654423	894.81	52.5	27.0 - 32.4	4.95	889.86
LF08-MW01A	1557152	654131	905.69	42.2	23.8 - 29.4	5.19	900.50
LF08-MW01C	1557142	654122	905.92	17.0	7.2 - 15.0	7.31	898.61
LF08-MW02A	1557372	654417	894.07	56.0	43.7-53.7	5.12	888.95
LF08-MW02C	1557391	654446	895.61	24.0	11.7-21.7	12.76	882.85
LF08MW04A	1557618	654837	913.45	68.0	51.3-63.0	31.41	882.04
LF08-MW04B	1557623	654828	912.76	39.0	29.5-37.0	25.15	887.61
LF08-MW04C	1557612	654828	914.02	28.0	21.0-26.0	23.05	890.97
LF08-MW05A	1556723	654623	949.38	88.0	59.8-69.8	31.61	917.77
LF08-MW05B	1556732	654680	949.17	53.8	41.7 - 51.7	21.50	927.67
LF08-MW05C	1556733	654621	949.30	30.0	17.75 - 27.75	19.62	929.68
LF08-MW06A	1557657	655112	891.30	80.0	53.5-73.8	28.97	862.33
LF08-MW06B	1557652	655106	890.63	45.0	32.75-42.75	12.66	877.97
LF08-MW07A	1556513	654823	952.62	64.0	43.7-53.7	23.51	929.11
LF08-MW07B	1556521	654828	952.56	40.0	33.0-38.0	24.05	928.51
LF08-MW07C	1556521	654819	952.79	31.0	24.0-29.0	24.07	928.72
LF08-MW08A	1557714	655230	878.70	36.0	16.7-32.0	5.14	873.56
LF08-MW08B	1557719	655238	878.63	24.0	16.67-22.0	5.09	873.54
LF08-MW08C	1557721	655230	877.72	14.0	6.67-11.67	9.62	868.10
LF08-MW09A	1557936	655487	855.38	32.5	25.2-30.2	15.20	840.18
LF08-MW09B	1557937	655481	856.01	20.5	13.67-18.67	14.92	841.09
LF08-MW10A	1557510	655374	911.86	66.0	53.7-63.8	25.39	886.47

Table 2-28
LF8 Groundwater Levels (10/12/98)
Wright-Patterson AFB, Ohio

Well No.	Easting (ft.)	Northing (ft.)	Ref. Point Elevation (ft)	Well Depth (ft)	Screen Interval (ft)	GW Depth (ft) 10/12/98	GW Elevation (ft) 10/12/98
LF08-MW10B	1557504	655385	912.27	39.0	29.8-34.8	23.21	889.06
LF08-MW10C	1557519	655384	911.83	25.0	17.5-22.5	22.38	889.45
LF08-MW11A	1556946	655424	934.37	57.0	49.8 - 54.8	12.91	921.46
LF08-MW11B	1556928	655430	934.95	44.3	31.75 - 42.0	11.95	923.00
LF08-MW11C	1556932	655417	935.18	23.9	12.25 - 22.5	11.04	924.14
LF08-MW12B	1556786	655539	936.03	35.8	26.2 - 33.5	12.80	923.23
LF08-MW12C	1556781	655555	936.16	13.5	6.2 - 11.2	12.88	923.28
LF08-MW13A	1556718	655659	934.01	88.5	76.2 - 86.2	14.78	919.23
LF08-MW13B	1556704	655666	933.22	30.9	18.5 - 28.5	11.75	921.47
LF08-MW13C	1556726	655673	933.48	19.7	7.2 - 17.2	12.11	921.37
LF08-MW14B	1556556	655433	942.45	38.0	24.4 - 28.9	13.18	929.27
LF08-MW14C	1556565	655451	941.75	21.2	7.0 - 17.0	12.02	929.73
LF08-MW15A	1557677	656863	841.67	20.6	6.0 - 11.0	8.60	833.07
LF08-MW15B	1557665	656869	841.98	35.0	16.0 - 31.0	14.50	827.48

Table 2-29
LF10 Groundwater Levels (10/12/98)
Wright-Patterson AFB, Ohio

Well No.	Easting (ft)	Northing (ft)	Ref. Point Elevation (ft)	Well Depth (ft)	Screen Interval (ft)	Depth to Water (ft)	GW Elev 10/12/98 (ft)	Estimated GW Elev (ft)
EW-1001	1558373	655167	908.28	53.0	3 0-53 0	24.40	883.88	
EW-1002	1558408	655241	921.78	53.0	3.0-53.0	52.81	868 97	
EW-1003	1558528	655193	915.81	66.0	6 0-66.0	22.39	893 42	
EW-1004	1558489	655275	923.08	63.0	5.0-63 0	DRY	DRY	860.08
EW-1006	1558419	655401	916.36	38.0	5.0-38 0	SEWAGE	SEWAGE	
EW-1008	1558315	655424	911.05	36.0	6.0-36.0	DRY	DRY	875.05
LF10-MW103	1558594	655461	909.65	42.0	32 0-42 0	34.73	874.92	
LF10-MW104	1558338	655171	909.40	82.0	70.0-80.0	DRY	DRY	827.40
LF10-MW01A	1558263	654535	918.50	106.0	87.0-92.0	75.52	842.98	
LF10-MW01B	1558253	654539	918.52	40 0	27 0-37 0	25.04	893.48	
LF10-MW01C	1558265	654545	918.57	14.0	6.0-11.0	14 92	903.65	
LF10-MW05B	1558089	655302	858.44	37.0	27 0-34 2	20.01	838.43	
LF10-MW05C	1558089	655302	859.06	11.0	3 42-8.42	10 58	848.48	
LF10-MW07A	1558345	655426	897 54	82.0	64.0-69.0	52.29	845 25	
LF10-MW07B	1558338	655437	897.01	36.0	19 3-24 3	29.04	867 97	
LF10-MW07C	1558334	655414	897.72	18.0	9.33-14 33	14.81	882.91	
LF10-MW08A	1559055	656238	863 35	92 2	79 9-89.9	68 06	795.29	
LF10-MW08B	1559110	656062	865.09	18.7	11 5-16 5	11.92	853.17	
01-004-M	1558364	655683	880 58	63.0	33.0 - 63.0	41.42	839.16	
01-005-M	- -	- -	839 72	46.0	35.0 - 46.0	10.08	829.64	
01-DM-101D-M	1558644	655032	914 54	85 0	78.8-83.8	DRY	DRY	829 54
01-DM-101S-M	1558643	655024	914 95	51 8	41.8-51.8	37.31	877.64	
EW-1011	1558561	655724	909 31	66 0	6.0-66.0	18.80	890.51	
EW-1012	1558469	655798	891.43	31 0	4 0-31.0	30.52	860.91	
EW-1013	1558477	655886	886.21	30.0	5.0-30.0	OBSTRUCTED	OBSTR	
EW-1014	1558518	655958	884.90	30.0	5.0-30.0	DRY	DRY	854 90
EW-1015	1558681	655792	907.94	62 0	6 0-62.0	DRY	DRY	845 94
EW-1016	1558686	655879	907.88	50.5	5.5-50.5	22.30	885 58	
EW-1017	1558732	655979	901.79	48.0	3.0-48.0	45.60	856 19	
EW-1018	1558630	655969	901.77	37.0	2.0-37.0	31.99	869.78	
EW-1019	1558588	656093	884.74	52.0	2.0-52.0	DRY	DRY	832 74
EW-1020	1558723	656335	868.18	35.0	4.0-35.0	33.75	834 43	

Table 2-29
LF10 Groundwater Levels (10/12/98)
Wright-Patterson AFB, Ohio
Page 2 of 2

Well No.	Easting (ft)	Northing (ft)	Ref. Point Elevation (ft)	Well Depth (ft)	Screen Interval (ft)	Depth to Water (ft)	GW Elev 10/12/98 (ft)	Estimated GW Elev (ft)
EW-1022	1558803	656372	871 32	65.0	5.0-65 0	78.57	792 75	
EW-1024	1558794	656041	891.25	41.0	5.0-41.0	39.66	851 59	
EW-1025	1558824	656301	877 61	43.0	3.0-43.0	29.85	847 76	
EW-1026	1558884	656379	861.26	85 0	6 0-85.0	65.14	796.12	
LF10-MW102	1558782	655907	891.25	65.0	55.0-66 0	61.71	829 54	
LF10-MW105	1558522	656189	Unknown	65 0	53.0-63.0	52 20	Unknown	
LF10-MW04A	1559287	655635	898.90	218.0	184.2-194 2	10.88	888.02	
LF10-MW04B	1559284	655638	898 86	126.0	113.65-123.65	98.98	799 88	
LF10-MW04C	1559279	655642	898.87	65.0	56.0-61.0	DRY	DRY	833.87
LF10-MW06A	1558854	655601	894.62	87.1	74.8-84.8	72 63	821.99	
LF10-MW06ADUP	1558844	655603	894.78	66.0	55.0-65.0	67 38	827 40	
LF10-MW06B	1558826	655601	894.09	44.0	37.15-42.50	34.48	859 61	
LF10-MW09A	1558360	656101	877 98	88.0	77 0-87.0	52.08	825.90	
LF10-MW09B	1558357	656119	878 21	61.0	46.4-57.0	DRY	DRY	817.21
LF10-MW09C	1558371	656113	878 17	45.0	31 05-41 10	35.33	842.84	
LF10-MW10A	1558951	656519	844 26	135.0	120 0-130.0	48 13	796.13	
LF10-MW10B	1558964	656516	844 40	26.0	13.75-23.75	DRY	DRY	818 40
LF10-MW10C	1558958	656518	844.19	68 0	56.0-66.0	49.25	794.94	
LF10-MW10D	1558972	656516	843.99	12 0	5 17-10.17	DRY	DRY	831 99
LF10-MW11A	1558415	656399	854.20	74.0	61.7-71.7	30.15	824.05	
LF10-MW11B	1558410	656390	854.52	43 0	30.2-40 2	28.15	826.37	
LF10-MW13A	1558419	656579	845.53	52.0	34.65 - 44.65	21.69	823.84	
LF10-MW13C	1558410	656581	845.64	40.0	17.0 - 27.0	21.83	823.81	
LF10-MW13D	1558430	656578	845.13	12 0	4.67 - 9.67	DRY	DRY	833 13
LF10-MW14A	1558150	653960	948 58	101.0	83 1 - 98.7	73.58	875.00	
01-DM-102D-M	1558748	656591	844 27	98.0	51.5 - 56.5	48.50	795.77	
01-DM-102S-M	1558775	656585	844.88	98.0	17.9 - 22.9	26 17	818.71	

Table 3-1
OU5 Monthly Water Levels for the LTM Program
Wright-Patterson AFB, Ohio

Well No.	Easting (ft)	Northing (ft)	Top of Casing Elevation (ft, MSL)	Total Depth (ft)	10/15/98 Depth to Water (ft)	10/15/98 Water Level Elevation (ft, MSL)	12/9/98 Depth to Water (ft)	12/9/98 Water Level Elevation (ft, MSL)
08-020-M	1554751.74	660587.66	791.12	25.00	22.38	768.74	22.52	768.60
08-021-M	1554787.19	660295.04	791.00	25.00	22.98	768.02	23.35	767.65
08-022-M	1555375.19	660149.93	796.24	36.00	25.99	770.25	25.85	770.39
08-023-M	1555980.09	660959.15	791.94	35.00	9.88	782.06	9.95	781.99
08-524-M	1555179.03	661424.17	790.80	15.40	10.98	779.82	11.15	779.65
08-525-M	1554802.65	661177.01	792.60	16.50	15.65	776.95	15.77	776.83
08-526-M	1554448.02	660846.24	791.50	18.00	Dry	Dry	14.08	777.42
08-527-M	1554422.12	660607.32	789.90	17.00	Dry	Dry	16.85	773.05
08-528-M	1554563.78	660402.24	791.30	18.00	Dry	Dry	Dry	Dry
CW04-60	1554832.90	659865.82	792.07	60.00	24.81	767.26	24.37	767.70
CW04-85	1554820.76	659882.25	790.08	90.00	22.72	767.36	22.30	767.78
CW05-55	1554816.20	660304.19	793.59	104.00	25.47	768.12	26.29	767.30
CW05-85	1554806.12	660331.37	793.85	85.50	25.62	768.23	27.06	766.79
CW06-77	1554784.88	660560.77	790.67	90.00	24.07	766.60	24.21	766.46
CW07-55	**1554794.76**	**661125.12**	791.79	55.00	14.20	777.59	15.76	776.03
CW07-100	**1554784.96**	**661149.04**	791.69	100.00	18.81	772.88	14.09	777.60
CW07-148	**1554799.78**	**661141.45**	791.78	150.00	14.25	777.53	13.92	777.86
CW08-17	**1554701.12**	**661428.50**	788.21	17.25	15.85	772.36	16.05	772.16
CW08-55	**1554697.17**	**661334.50**	787.91	55.00	**13.90**	774.01	13.90	774.01
CW08-110	1554710.68	661423.74	786.81	110.00	**12.78**	774.03	12.72	774.09
HD-10D	1554795.44	659498.14	793.24	73.00	26.42	766.82	25.80	767.44
HD-11	1554695.23	660298.27	791.86	85.00	22.28	769.58	24.70	767.16
HD-12M	1554653.82	660568.71	792.46	83.00	23.92	768.54	24.03	768.43
HD-13S	1554700.94	660074.76	789.55	33.00	22.28	767.27	22.10	767.45
HD-14S	1553908.42	659614.71	790.94	33.00	26.20	764.74	24.75	766.19
EW-1	1554791.95	660312.29	810.42				49.40	761.02

Table 4-1
OU4 Landfill Gas Monitoring Results: October 1998
Wright-Patterson AFB, Ohio

Monitoring Location	Date	CO_2 %	O_2 %	CH_4 %	LEL %
LG-1	04/17/98	1.7	18.6	0	0
	10/14/98	5.9	16.1	0	NM
LG-2	04/17/98	3.7	21.7	0	0
	10/14/98	7 6	13.1	0	NM
LG-3	04/17/98	2.9	22 9	0	0
	10/14/98	3.8	18 4	0	NM
LG-6	04/17/98	2.6	13.7	0	0
	10/14/98	5.1	13.9	0	NM
LG-7	04/17/98	0.8	18.7	0	0
	10/14/98	2.1	18.7	0	NM
LG-8	04/17/98	1.9	18.8	0	0
	10/14/98	4	15.6	0	NM
LG-9	04/17/98	1 8	14	0	0
	10/14/98	4.2	10.4	0	NM
LG-10	04/17/98	8 3	0	1.9	16
	10/14/98	9.2	0	3.1	NM
Bldg. 877 Center	04/17/98	NS	NS	NS	NS
	10/14/98	0	20.3	0	NM
Bldg. 878A NW	04/17/98	NS	NS	NS	NS
	10/14/98	0	20.3	0	NM
Bldg. 878A SE	04/17/98	NS	NS	NS	NS
	10/14/98	0	20.3	0	NM

CO_2 = Carbon dioxide
O_2 = Oxygen
CH_4 = Methane
LEL = Lower Explosive Level
NM = Not measured
NS = Not sampled

Table 5-1
OU4 Monitoring Well Construction Specifications
Wright-Patterson AFB

Well ID	Borehole Diameter (inches)	Borehole Depth (feet)	Well Depth (feet)	Screen Length (feet)	Depth to Screen (feet)	Depth to Sand Pack (feet)	Sand Pack Thickness (feet)	Depth to Seal (feet)	Seal Thickness (feet)
BMP-OU4-01B-60	6.0	60.0	60.0	10.0	50.0	47.5	12.5	44.0	3.5
BMP-OU4-01C-84	6.0	85.0	84.0	10.0	74.0	70.0	15.0	67.0	3.0

Survey Data

Well ID	Northing	Easting	Ground Surface Elevation (ft, MSL)	Monitoring Point Elevation (ft, MSL)
BMP-OU4-01B-60	659355.78	1561892.23	804.85	804.47
BMP-OU4-01C-84	659354.49	1561888.69	804.93	804.44

Table 6-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio
Page 1 of 3

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (usiemens)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)
BS5 P-1	11/4/98	30.4	13	6.66	0.736	208	169 9	6 62	NR
BS5 P-2	11/4/98	31.02	12 3	6.53	0.634	Offscale	364.9	6.87	NR
BS5 P-3	11/4/98	35.56	14.6	6.6	0.742	473	163	5 2	NR
BS5 P-4	11/4/98	35.76	13.4	6.63	0.735	146	152.7	5.83	NR
BS6 P-1	11/4/98	6 03	15.3	6.59	0.611	10	79.1	0.91	NR
BS6 P-2	11/5/98	5.36	14.5	6.55	1.35	213	-102.5	1.98	NR
WP-NEA-MW27-3I	10/28/98	19.09	14.5	6.88	0.825	20	83	5.6	NR
WP-NEA-MW34-2S	10/23/98	11.32	15.2	6.75	0.627	7	146.5	6.27	NR
FTA2:MW02C	10/28/98	14.52	18.1	6.44	0 695	0	-179 6	0 57	NR
LF12 MW15A	10/21/98	8.21	15.5	6.52	0 697	0	14.1	-10	NR
07-520-M	10/21/98	9.61	15 1	6 56	1.08	0	-134.9	5.19	NR
05-DM-123S	10/21/98	7.44	14.7	6 57	0.805	3	7 7	0.76	0.57
05-DM-123I	10/21/98	8.39	14	6.61	0.793	8	-44 9	-0 09	0
05-DM-123D	10/21/98	7.75	14.1	6 6	0.8	1	-160	0.1	1.32
BMP-OU4-1B-60	10/21/98	8.71	14.1	6.53	1.41	-1	-22.6	-10	NR
BMP-OU4-1C-84	10/20/98	8.53	15.5	6.73	1.15	19	-127 9	1.18	NR
OU4-MW-02A	10/20/98	13.25	14.5	6.96	1.15	112	-63.3	11 19	NR
OU4-MW-02B	10/20/98	12.95	13.3	7 07	120	9	36.5	12 75	NR

Table 6-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (usiemens)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)
OU4-MW-03B	10/20/98	14.1	12.9	6 97	1.48	5	84.8	0.47	NR
OU4-MW-03C	10/20/98	13.92	13 2	6 99	1.3	16	120.7	2.17	NR
OU4-MW-04A	10/20/98	14.32	13	6.3	1.39	1	-70.3	1 53	NR
OU4-MW-12B	10/20/98	13.21	14.4	6 62	1 03	0	78.9	1 32	NR
CW05-055	10/23/98	26.55	12.4	6.67	0.92	0	-62.9	0.94	NR
CW05-085	10/21/98	27.13	12.2	7	1.04	0	-84 9	1.76	NR
HD-11	10/28/98	24.55	12.4	6 92	0.99	169	-94.3	0.55	NR
HD-12M	10/28/98	24.1	12 2	6 92	0.98	15	-89.8	0.17	NR
HD-13S	10/26/98	22.45	13.3	7.12	0.98	44	-47.1	6.17	NR
HSA-4A (MW131M)	10/26/98	20.15	12.3	7.06	0.98	24	-96.4	0.24	NR
HSA-4B (MW131S)	10/26/98	NR	13	7.01	0.92	25	-84.1	0.1	NR
HSA-5 (MW132S)	10/26/98	24.35	12	6 99	0.93	0	20.9	0.07	NR
CW3-77	10/21/98	31 31	16.7	6.76	0.543	18	93.8	-0 09	NR
CHP4-MW01	10/16/98	27.63	16.9	6 99	1.55	71	-38	3.25	NR
GR-330	10/16/98	33.09	14.2	7.01	0 97	13	9.3	2 93	NR
GR-333	10/27/98	15.35	16	6.52	0.859	31	4.8	6	NR
GR-334	10/28/98	14.62	15	6 56	0.603	0	-104.7	0 27	NR
OU10-MW-06D	10/23/98	29 29	14.1	5 15	0.94	23	413.1	8 5	NR

Table 6-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio

Well Number	Date Sampled	Depth to Water (ft, TOC)	Temp. (C°)	pH (SU)	Conductivity (usiemens)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Ferrous Iron (mg/L)
OU10-MW-06S	10/23/98	27.45	14.9	4.56	0.827	55	107.7	3.82	NR
OU10-MW-11D	10/20/98	12.23	14.2	6.6	0.833	3	181.8	0.77	0.04
OU10-MW-11S	10/20/98	11.37	14.3	6.42	0.82	3	214.2	3.3	0.02
OU10-MW-19D	10/20/98	34.44	14 8	6.66	0.916	0	173.2	4.13	0
OU10-MW-21S	10/27/98	8.1	15 5	6.57	0.736	4	81	1.46	NR
OU10-MW-25S	10/20/98	27.8	15 1	6.72	0.765	0	76.3	-2 48	NR
WP-NEA-MW37-1D	10/16/98	11	18.9	7.07	0.665	105	-112.4	8.77	0.22
23-578-M	10/29/98	31.82	15.1	6.62	1.59	31	94.8	6.11	NR

BTP - Below top of pump
DO - Dissolved Oxygen
NA - Not available
NR - No reading
ORP - Oxygen Reduction Potential

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio
Page 1 of 5

Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	PCE (ug/L)
	MCL		**5**	**5**	**70**	**5**	**2**	**5**
BS5 P-1	BS5	4-Jun-97	ND	ND	ND	ND	ND	ND
		4-Nov-98	ND	ND	ND	0 41J	ND	1 5=
BS5 P-2	BS5	4-Jun-97	ND	ND	ND	ND	ND	ND
		4-Nov-98	ND	ND	ND	ND	ND	ND
BS5 P-3	BS5	6-Jun-97	ND	ND	ND	ND	ND	(23=)
		4-Nov-98	ND	ND	ND	0 27J	ND	(29=)
		(Dup)	ND	ND	ND	0.30J	ND	(33=)
BS5 P-4	BS5	6-Jun-97	ND	ND	ND	ND	ND	(29=)
		4-Nov-98	ND	ND	ND	0 34J	ND	(33=)
BS6 P-1	BS6	5-Jun-97	ND	ND	ND	ND	ND	ND
		4-Nov-98	ND	ND	ND	ND	ND	ND
BS6 P-2	BS6	5-Jun-97	ND	ND	ND	ND	ND	ND
		5-Nov-98	ND	ND	ND	ND	ND	ND
WP-NEA-MW27-3I	OU2	30-Mar-93	ND	ND	ND	ND	ND	(21 =)
	(OU10)	25-Aug-93	ND	ND	ND	ND	ND	(22 =)
		7-Dec-93	ND	ND	ND	ND	ND	(20 =)
		27-Apr-98	ND	ND	ND	0 17 J	ND	(26 =)
		28-Oct-98	ND	ND	ND	ND	ND	(18 =)
WP-NEA-MW34-2S	OU2	15-Dec-92	ND	ND	ND	(15 =)	ND	ND
		26-Apr-93	ND	ND	ND	ND	ND	ND
		23-Apr-98	ND	ND	ND	ND	ND	ND
		23-Oct-98	ND	ND	ND	ND	ND	ND
FTA2 MW02C	OU3	13-Jul-93	(6 =)	ND	ND	ND	ND	ND
		24-Jan-94	2 =	ND	ND	ND	ND	ND
		23-Apr-98	ND	ND	ND	ND	ND	ND
		28-Oct-98	ND	ND	ND	ND	ND	ND
LF12 MW15A	OU3	6-Jul-93	ND	ND	ND	12.11=	ND	ND
		10-Jan-94	ND	ND	ND	1 0=	ND	ND
		21-Oct-98	ND	ND	0 57 J	1 8 =	ND	ND
07-520-M	OU3	1-Jul-93	ND	ND	ND	ND	ND	ND
		1-Jun-94	ND	ND	0 3J	ND	ND	ND
		21-Oct-98	ND	ND	0 21J	ND	ND	ND

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio

Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	PCE (ug/L)
	MCL		5	5	70	5	2	5
05-DM-123S	OU3	13-Jul-93	ND	ND	ND	2=	ND	ND
		11-Jan-94	ND	ND	ND	2=	ND	ND
		14-Apr-94	ND	ND	ND	2=	ND	ND
		31-Aug-94	ND	ND	ND	2=	ND	ND
		21-Oct-98	ND	ND	0 85J	2.2=	ND	ND
05-DM-123I	OU3	26-Jul-93	ND	ND	ND	2=	ND	ND
		11-Jan-94	ND	ND	ND	2=	ND	ND
		14-Apr-94	ND	ND	ND	2=	ND	ND
		31-Aug-94	ND	ND	ND	2 2=	ND	ND
		21-Oct-98	ND	ND	0 48J	2 7=	ND	ND
05-DM-123D	OU3	22-Jul-93	ND	ND	ND	ND	ND	ND
		11-Jan-94	ND	ND	ND	ND	ND	ND
		14-Apr-94	ND	ND	ND	ND	ND	ND
		31-Aug-94	ND	ND	ND	ND	ND	ND
		21-Oct-98	ND	ND	ND	1 6	ND	ND
BMP-OU4-1B-60	OU4	21-Oct-98	ND	ND	3.1 =	4 5 =	0.5 J	ND
BMP-OU4-1C-84	OU4	20-Oct-98	ND	ND	ND	ND	ND	ND
OU4-MW-02A	OU4	22-Jul-93	ND	ND	ND	2 =	ND	ND
		26-Aug-93	ND	ND	ND	4 =	ND	ND
		15-Dec-93	ND	ND	ND	(5 =)	ND	ND
		23-Apr-98	ND	ND	4.4 =	0.56 J	ND	ND
		20-Oct-98	ND	ND	7.1 =	1 7 =	ND	ND
OU4-MW-02B	OU4	15-Dec-93	ND	ND	ND	(23 =)	ND	ND
		26-Aug-93	ND	ND	ND	(22 =)	ND	ND
		23-Apr-98	ND	ND	0 74 J	(21 =)	ND	ND
		20-Oct-98	ND	ND	0 69 =	(16 =)	ND	ND
OU4-MW-03B	OU4	24-Aug-93	ND	ND	ND	(17 =)	ND	ND
		15-Dec-93	ND	ND	ND	(16 =)	ND	ND
		21-Apr-98	ND	ND	0 61 J	(12 =)	ND	ND
		20-Oct-98	ND	ND	0 61 =	(10 =)	ND	ND
OU4-MW-03C	OU4	24-Aug-93	ND	ND	ND	(22 =)	ND	ND
		14-Dec-93	ND	ND	ND	(24 =)	ND	ND
		21-Apr-98	ND	ND	0 96 J	(21 =)	ND	ND
		20-Oct-98	ND	ND	1.0 =	(15 =)	ND	ND

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio

Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	PCE (ug/L)
	MCL		**5**	**5**	**70**	**5**	**2**	**5**
OU4-MW-04A	OU4	22-Jul-93	ND	ND	ND	ND	0.5 J	ND
		23-Aug-93	ND	ND	ND	ND	ND	ND
		13-Dec-93	ND	ND	ND	ND	(2 =)	ND
		23-Apr-98	ND	ND	ND	ND	ND	ND
		20-Oct-98	ND	ND	ND	ND	ND	ND
OU4-MW-12B	OU4	26-Aug-93	ND	ND	ND	(12 =)	ND	ND
		15-Dec-93	ND	ND	ND	(14 =)	ND	ND
		23-Apr-98	ND	ND	0 70 J	(11 =)	ND	1 2 =
		20-Oct-98	ND	ND	1 1 =	(9 =)	ND	2 5 =
CW05-055	OU5	25-Oct-93	ND	ND	2=	(8 4=)	ND	ND
		7-Mar-94	ND	ND	29 7=	(6 8=)	2=	ND
		23-Oct-98	ND	ND	19 7=	(6 1=)	ND	ND
CW05-085	OU5	25-Oct-93	ND	ND	25 6=	(316.5=)	ND	ND
		14-Feb-94	ND	ND	12=	(360=)	ND	ND
		21-Oct-98	ND	ND	10=	(83=)	ND	ND
HD-11	OU5	28-Oct-98	ND	ND	30 5J	(51=)	ND	ND
HD-12M	OU5	28-Oct-98	ND	ND	ND	1 3=	ND	ND
HD-12S	OU5	28-Oct-98	Dry					
HD-13S	OU5	26-Oct-98	ND	ND	17 30J	0 28J	1 5=	ND
HSA-4A (MW131M)	OU5	11-Oct-93	ND	ND	23=	(190=)	ND	ND
		24-Feb-94	ND	0.7J	50=	(66=)	ND	ND
		26-Oct-98	ND	ND	~~50 4 J~~	~~1 0=~~	~~3 4=~~	ND
					52 4 J	1.2 =	(4.2 =)	
HSA-4B (MW131S)	OU5	2-Nov-93	ND	ND	ND	(14 5=)	ND	(6.7=)
		23-Feb-94	ND	ND	ND	(9.8=)	ND	(6 3=)
		26-Oct-98	ND	ND	2.0=	3 1=	ND	1.5=
HSA-5 (MW132S)	OU5	2-Nov-93	ND	ND	ND	(20 6=)	ND	(12 1=)
		23-Feb-94	ND	ND	1 2J	(25 2=)	ND	(10 5=)
		26-Oct-98	ND	ND	ND	ND	ND	ND
	Dup	26-Oct-98	ND	ND	0 55 =	(33 =)	ND	(7 3 =)
CW03-77	OU8	19-Aug-93	ND	ND	ND	2=	ND	ND
		29-Oct-93	ND	ND	1=	(8=)	ND	ND
		6-Apr-94	ND	ND	1=	(9=)	ND	ND
		25-Aug-94	ND	ND	ND	(7 4=)	ND	ND
		21-Oct-98	ND	ND	0 28 J	3.7 =	ND	1 1 =

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio

Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	PCE (ug/L)
	MCL		**5**	**5**	**70**	**5**	**2**	**5**
CHP4-MW01	OU10	5-Dec-95	ND	ND	ND	(8=)	ND	(5 =)
		22-Apr-98	ND	ND	ND	4 5 =	ND	4 7 =
		16-Oct-98	ND	ND	ND	2 1 =	ND	2.5 =
GR-330	OU10	1-Sep-93	ND	ND	ND	ND	ND	(20 =)
		3-Nov-93	ND	ND	ND	ND	ND	(13 =)
		7-Apr-94	ND	ND	ND	ND	ND	(22 =)
		30-Aug-94	ND	ND	ND	ND	ND	(37 =)
		7-Dec-95	ND	ND	ND	ND	ND	(16 =)
		24-Apr-98	ND	ND	ND	ND	ND	(43 =)
		16-Oct-98	ND	ND	ND	ND	ND	(30 =)
GR-333	OU10	3-Apr-93	ND	ND	ND	(5 =)	ND	ND
		30-Aug-93	ND	ND	ND	(6 =)	ND	ND
		9-Dec-93	ND	ND	ND	(6 =)	ND	ND
		13-Apr-94	ND	ND	ND	(6 =)	ND	ND
		22-Apr-98	ND	ND	ND	(6 1 =)	ND	0 58 J
		27-Oct-98	ND	ND	ND	4 9 =	ND	0 68 =
GR-334	OU10	3-Apr-93	ND	ND	ND	ND	ND	ND
		13-Apr-94	ND	ND	ND	ND	ND	ND
		30-Aug-94	ND	ND	ND	(7 =)	ND	ND
		22-Apr-98	ND	ND	ND	ND	ND	ND
		28-Oct-98	ND	ND	ND	ND	ND	ND
WP-NEA-MW37-1D	OU10	27-Aug-93	(7 =)	ND	ND	ND	ND	ND
		13-Dec-93	ND	ND	ND	ND	ND	ND
		23-Apr-98	ND	ND	ND	ND	ND	ND
		16-Oct-98	ND	ND	ND	ND	ND	ND
OU10-MW-06S	OU10	6-Oct-94	ND	ND	ND	2 =	ND	ND
		13-Jan-95	ND	ND	ND	(10 =)	ND	ND
		24-Apr-98	ND	ND	ND	(13 =)	ND	ND
		23-Oct-98	ND	ND	ND	(14 =)	ND	ND
OU10-MW-06D	OU10	06-Oct-94	ND	ND	ND	ND	ND	(20 =)
		13-Jan-95	ND	ND	ND	ND	ND	(10 =)
		20-Apr-98	ND	ND	ND	ND	ND	2 6 =
		23-Oct-98	ND	ND	ND	ND	ND	ND
OU10-MW-11S	OU10	05-Oct-94	ND	ND	ND	ND	ND	(10 =)
		10-Jan-95	ND	ND	ND	ND	ND	(11 =)
		27-Apr-98	ND	ND	ND	ND	ND	(12 =)
		20-Oct-98	ND	ND	ND	0 39 J	ND	(12 =)

Table 6-2
Basewide LTM Round 1 and Historic Groundwater Sampling Results: VOCs with MCLs
Wright-Patterson AFB, Ohio

Sample Location	Management Area	Date Sampled	Benzene (ug/L)	1,2-DCA (ug/L)	1,2-DCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	PCE (ug/L)
	MCL		**5**	**5**	**70**	**5**	**2**	**5**
OU10-MW-11D	OU10	05-Oct-94	ND	ND	ND	(6 =)	ND	ND
		10-Jan-95	ND	ND	ND	(7 =)	ND	ND
		23-Apr-98	ND	ND	ND	3 0 =	ND	0 65 J
		20-Oct-98	ND	ND	ND	(10 =)	ND	0 92 =
OU10-MW-19D	OU10	06-Oct-94	ND	ND	ND	(7 =)	ND	ND
		11-Jan-95	ND	ND	ND	(6 =)	ND	ND
		24-Apr-98	ND	ND	ND	(7 1 =)	ND	ND
		20-Oct-98	ND	ND	ND	(5 7 =)	ND	ND
OU10-MW-21S	OU10	05-Oct-94	ND	ND	ND	(9 =)	ND	ND
		12-Jan-95	ND	ND	ND	(7 =)	ND	ND
		23-Apr-98	ND	ND	ND	(10 =)	ND	ND
		27-Oct-98	ND	ND	ND	(9 4 =)	ND	ND
OU10-MW-25S	OU10	08-Oct-94	ND	ND	ND	ND	ND	(19 =)
		12-Jan-95	ND	ND	ND	ND	ND	(22 =)
		24-Apr-98	ND	ND	ND	ND	ND	(19 =)
		20-Oct-98	ND	ND	ND	ND	ND	(18 =)
23-578-M	OU10	1-Nov-93	ND	ND	ND	(52=)	ND	2=
		14-Apr-94	ND	ND	ND	(28=)	ND	1=
		1-Sep-94	ND	ND	ND	(43=)	ND	2=
		29-Oct-98	ND	ND	ND	ND	ND	ND

( ) - Concentration exceeds MCL.
ND - Concentration is below detection limits
ug/L - micrograms per liter
MCLs - Maximum Contaminant Levels

1,1,2-TCA - 1,1,2-Trichloroethane
1,1-DCE - 1,1-Dichloroethylene
1,2-DCA - 1,2-Dichloroethane
1,2-DCP - 1,2-Dichloropropane
TCE - Trichloroethylene
PCE - Tetrachloroethylene
1,2-DCE - 1,2-Dichloroethene (Total)
-- - Not reported in USGS BMP Summary Report, 1993-1994.

Table 7-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio
Page 1 of 2

Well Number	Date Sampled	Depth to Water (ft, TOC)	Easting (ft)	Northing (ft)	Aquifer Layer	Easting ROT (ft)	Northing ROT (ft)	Wellhead Elevation (ft, MSL)	Water Elevation (ft, MSL)
BS5 P-1	11/4/98	30 4	1,548,320 00	649,705 15	1	10,484 93	9,890 13	801 74	771 34
BS5 P-2	11/4/98	31 02	1,548,608 99	649,761 25	1	10,738 55	9,740 66	802 34	771 32
BS5 P-3	11/4/98	35 56	1,548,593 42	649,375 78	1	10,471 47	9,462 27	806 86	771 30
BS5 P-4	11/4/98	35 76	1,548,613 09	649,372 38	2	10,483 95	9,446 69	807 03	771 27
BS6 P-1	11/4/98	6 03	1,552,270 39	650,334 83	1	13,860 84	7,744 13	855.20	849 17
BS6 P-2	11/5/98	5 36	1,552,519 87	650,187 69	1	13,950 19	7,468 62	866 88	861 52
WP-NEA-MW27-3I	10/28/98	19 09	1,570,089 11	667,990 53	2	38,905 30	9,160 43	824 92	805 83
WP-NEA-MW34-2S	10/23/98	11 32	1,569,080 05	670,143 01	1	39,575 83	11,441 16	816 60	805 28
FTA2 MW02C	10/28/98	14 52	1,560,325 01	667,077 90	1	30,987 69	14,946 79	804 20	789 68
LF12 MW15A	10/21/98	8 21	1,558,286 19	664,940 40	1	28,044 35	14,696 86	796 20	787 99
07-520-M	10/21/98	9 61	1,558,145 00	665,335 40	1	28,200 34	15,086 26	789 80	780 19
05-DM-123S	10/21/98	7 44	1,558,208 73	664,886 12	1	27,950 37	14,707 54	798 60	791 16
05-DM-123I	10/21/98	8 39	1,558,202 65	664,870 33	1	27,935 36	14,699 74	798 64	790 25
05-DM-123D	10/21/98	7 75	1,558,201 18	664,860 04	1	27,927 44	14,693 01	798 20	790 45
BMP-OU4-1B-60	10/21/98	8 71	1,561,892 23	659,355 78	2	27,044 64	8,124 80	804 47	795 76
BMP-OU4-1C-84	10/20/98	8 53	1,561,888 69	659,354 49	3	27,041 13	8,126 18	804 44	795 91
OU4-MW-02A	10/20/98	13 25	1,562,381 07	659,330 38	1	27,393 93	7,781 86	809 50	796 25
OU4-MW-02B	10/20/98	12 95	1,562,381 69	659,338 29	2	27,399 63	7,787 37	809 34	796 39
OU4-MW-03B	10/20/98	14 1	1,562,192 53	659,158 39	2	27,138 75	7,777 98	810 25	796 15
OU4-MW-03C	10/20/98	13 92	1,562,186 05	659,166 72	3	27,139 42	7,788 51	809 97	796 05
OU4-MW-04A	10/20/98	14 32	1,562,039 28	658,876 25	1	26,837 02	7,668 21	810 50	796 18
OU4-MW-12B	10/20/98	13 21	1,562,509 87	659,391 25	2	27,530 73	7,742 10	808 00	794 79
CW05-055	10/23/98	26 55	1,554,816 20	660,304 19	2	22,373 44	13,523 83	794 20	767 65
CW05-085	10/21/98	27 13	1,554,806 12	660,331 37	2	22,383 90	13,550 87	793 86	766 73
HD-11	10/28/98	24 55	1,554,695 23	660,298 27	1	22,278 92	13,599 56	791 50	766 95
HD-12M	10/28/98	24 1	1,554,653 82	660,568 71	2	22,427 10	13,829 54	791 50	767 40
HD-13S	10/26/98	22 45	1,554,700 94	660,074 76	1	22,135 09	13,428 37	789 50	767 05
HSA-4A (MW131M)	10/26/98	20 15	1,554,487 46	660,341 21	2	22,151 76	13,769 39	787 31	767 16
HSA-4B (MW131S)	10/26/98	NR	1,554,473 39	660,335 99	1	22,137 76	13,774 80	788 31	
HSA-5 (MW132S)	10/26/98	24 35	1,553,806 91	659,971 67	1	21,397 19	13,943 57	789 78	765 43
CW3-77	10/21/98	31 31	1,550,780 90	656,905 10	3	17,098 87	13,651 94	791 26	759 95
CHP4-MW01	10/16/98	27 63	1,569,476 05	663,070 59	1	35,186 09	5,881 83	835 11	807 48
GR-330	10/16/98	33 09	1,568,740 00	660,830 00	1	33,150 16	4,691 45	841 80	808 71
GR-333	10/27/98	15 35	1,566,808 22	664,655 74	1	34,238 36	8,836 80	814 57	799 22
GR-334	10/28/98	14 62	1,566,801 08	664,647 46	3	34,227 52	8,835 33	813 95	799 33
23-578-M	10/29/98	31 82	1,569,711 00	662,705 00	1	35,119 81	5,452 34	841 00	809 18

Table 7-1
Round 1 Basewide LTM Groundwater Field Parameters
Basewide Monitoring Program
Wright-Patterson AFB, Ohio

Well Number	Date Sampled	Depth to Water (ft, TOC)	Easting (ft)	Northing (ft)	Aquifer Layer	Easting ROT (ft)	Northing ROT (ft)	Wellhead Elevation (ft, MSL)	Water Elevation (ft, MSL)
OU10-MW-06D	10/23/98	29.29	1,568,999.30	667,189.85	3	37,558.53	9,282.88	829.73	800.44
OU10-MW-06S	10/23/98	27.45	1,568,994.90	667,187.17	2	37,553.46	9,283.79	830.07	802.62
OU10-MW-11D	10/20/98	12.23	1,567,705.10	665,985.15	2	35,790.97	9,238.18	812.55	800.32
OU10-MW-11S	10/20/98	11.37	1,567,709.00	665,989.36	2	35,796.68	9,238.75	812.57	801.20
OU10-MW-19D	10/20/98	34.44	1,567,865.30	663,566.36	2	34,308.21	7,320.46	834.32	799.88
OU10-MW-21S	10/27/98	8.1	1,563,497.30	663,808.71	1	31,197.36	10,396.29	804.45	796.35
OU10-MW-25S	10/20/98	27.8	1,570,194.80	667,017.73	1	38,339.85	8,361.81	834.10	806.30
WP-NEA-MW37-1D	10/16/98	11	1,566,365.42	667,460.87	2	35,765.45	11,231.13	811.25	800.25

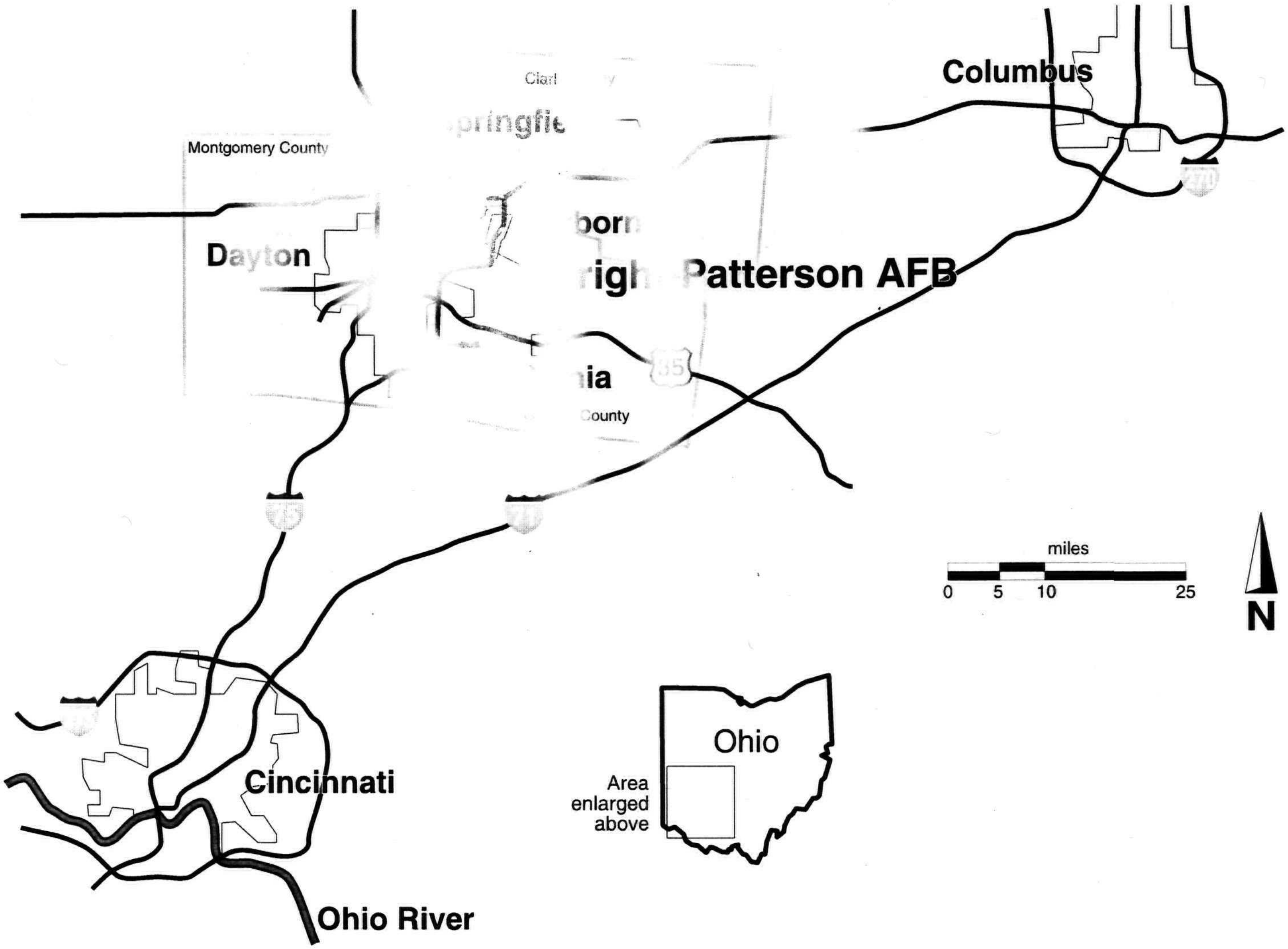

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Figure 1-1. Area Location Map.

Source: ES, 1982

DRAWING BY	JIS, III	CHECKED BY	PCM	2/1/95	DRAWING NO.
	4/27/94	APPROVED BY	SWS	2/1/95	S-777097.01 [illegible] 4/99-4w

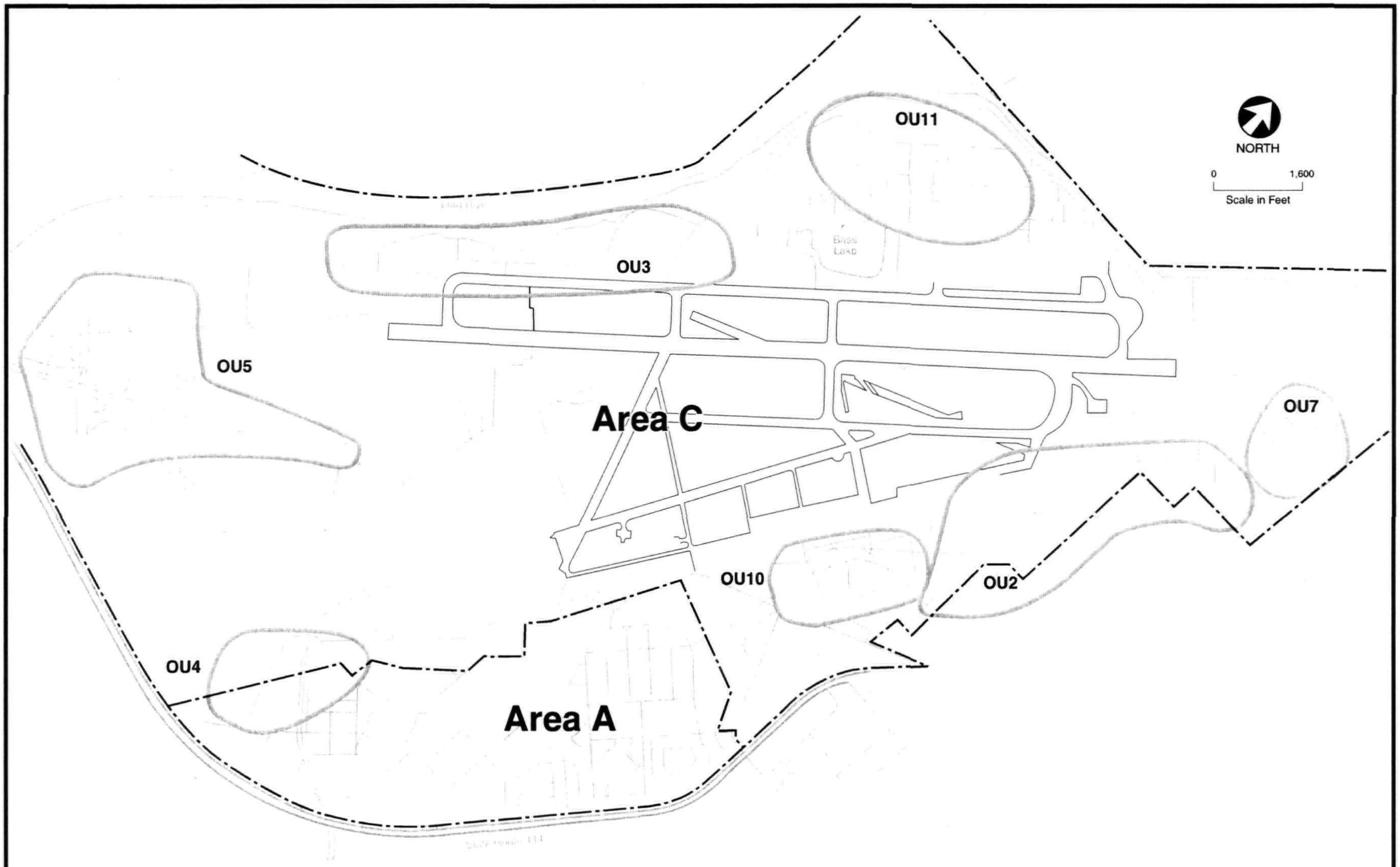

Figure 1-2. WPAFB OUs - Areas A and C.

Source: Map (CH2M Hill, 1994)

DRAWING BY	JIS, III	CHECKED BY	TAC	12/15/98	DRAWING NO.
	12/15/98	APPROVED BY			S-777097.0108-4/99-3w

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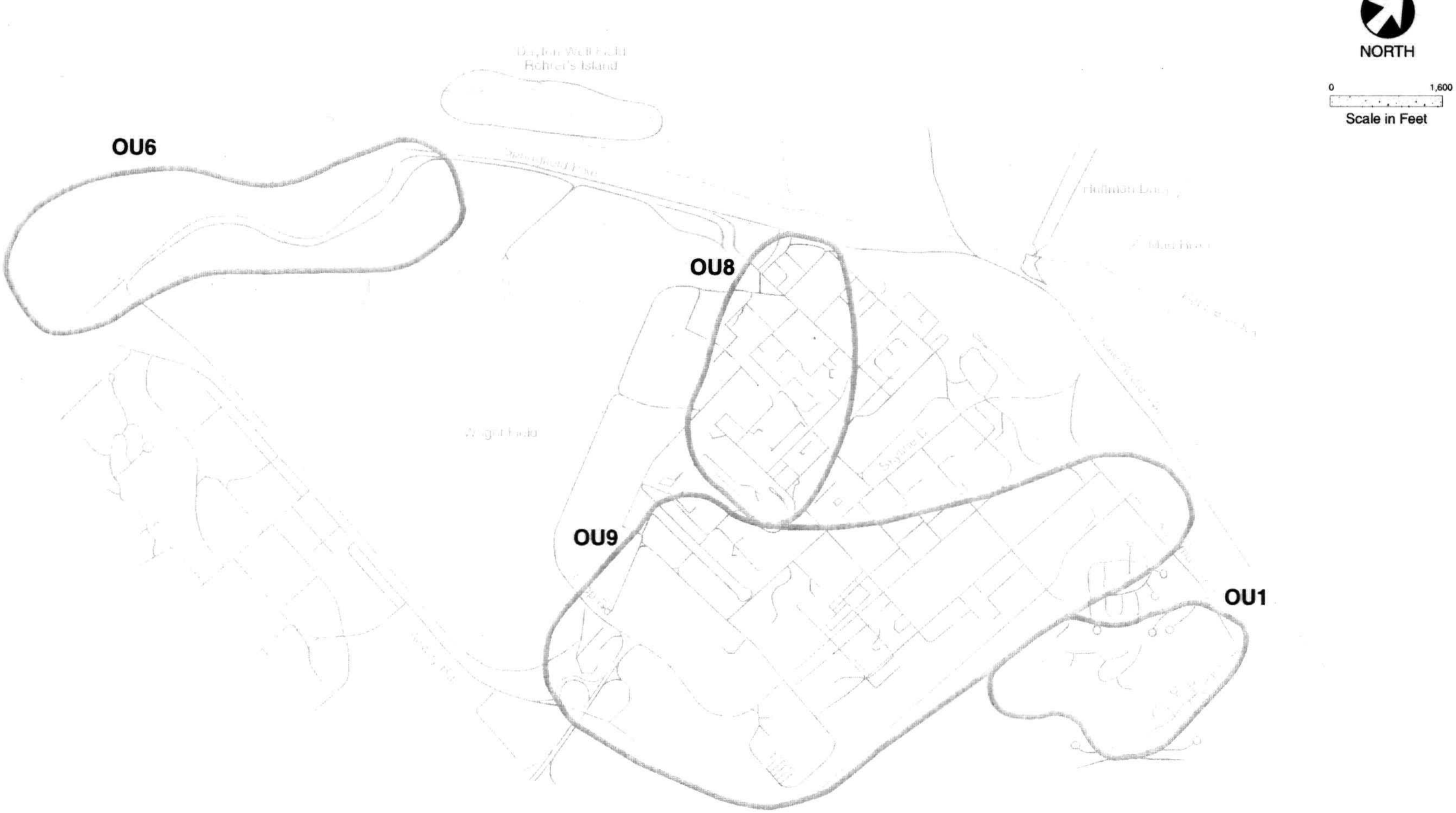

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Figure 1-3. WPAFB OUs - Area B.

Source: Map (CH2M Hill, 1994)

DRAWING BY	JIS, III	CHECKED BY	JIS, III	4/21/95	DRAWING NO.
	4/21/95	APPROVED BY	SRS	4/24/95	S-777097.0108-4/99-2w

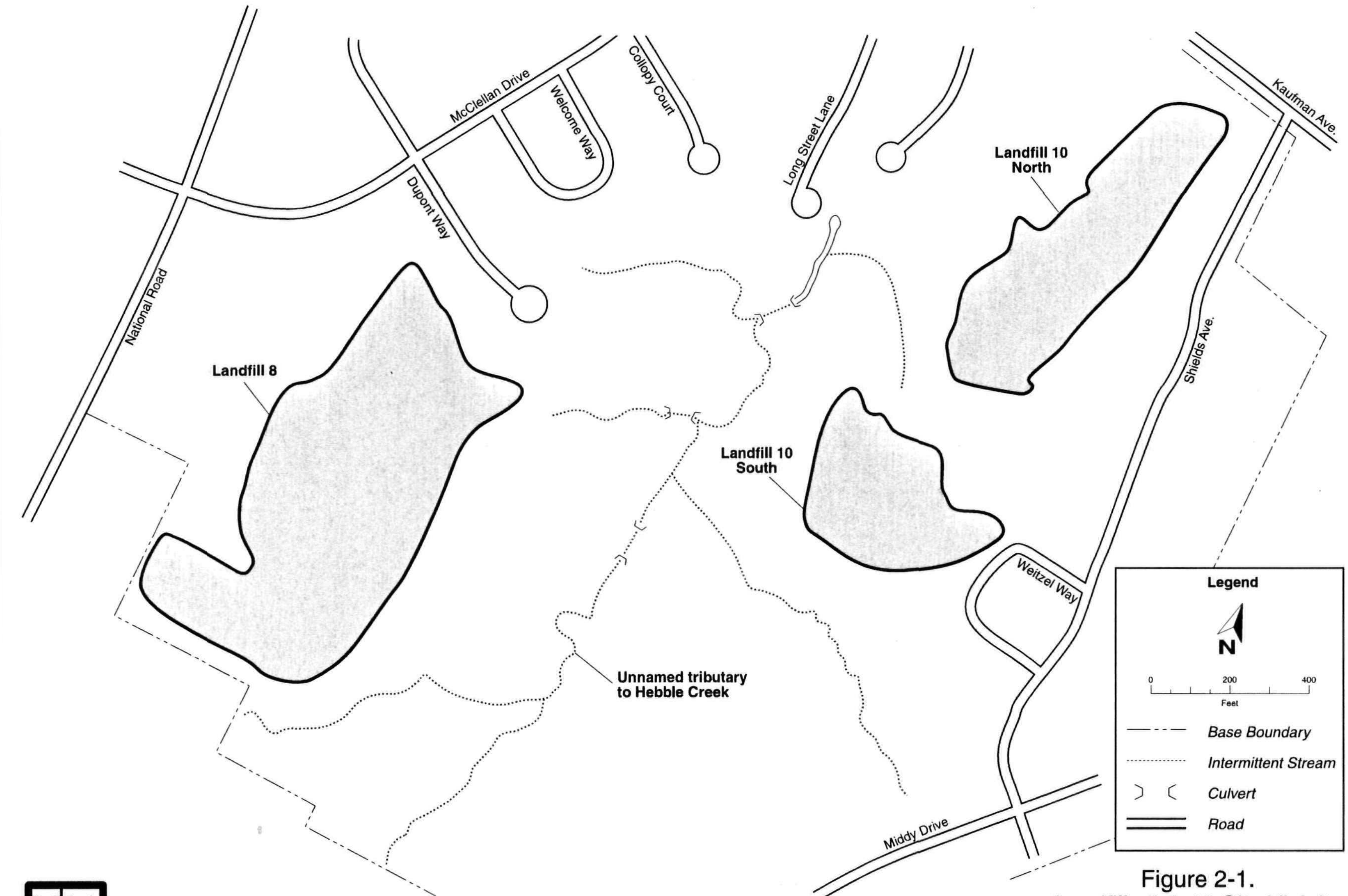


Figure 2-1.
Landfills 8 & 10 Site Vicinity
Prepared for
Wright-Patterson Air Force Base
Dayton, OH

IT CORPORATION

DRAWING BY	JIS, III	CHECKED BY			DRAWING NO.
	12/9/93	APPROVED BY			S-777097.0108-4/93-1w

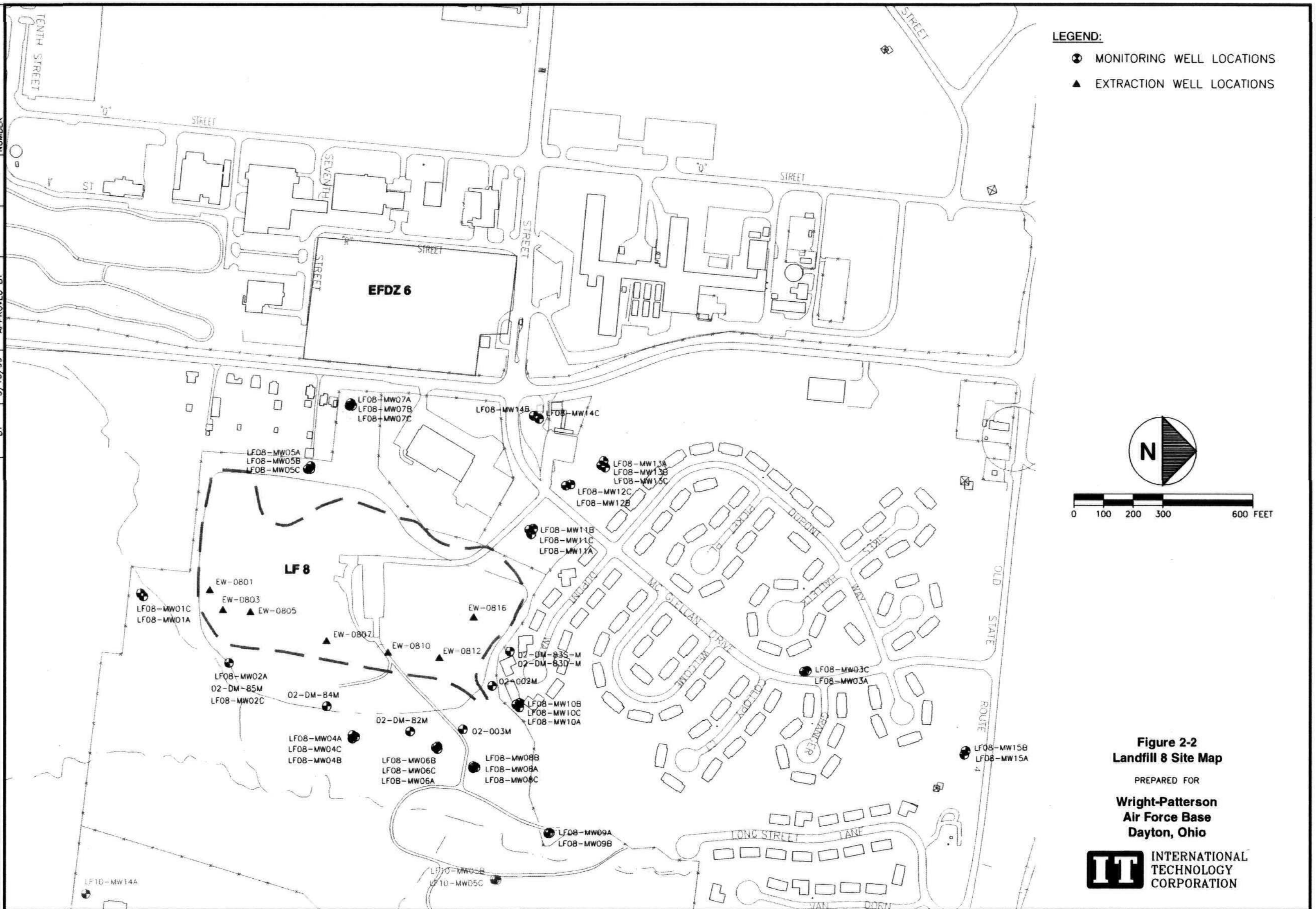


Figure 2-2
Landfill 8 Site Map

PREPARED FOR

Wright-Patterson
Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

DRAWN BY	MSN 3/16/99	CHECKED BY / APPROVED BY	GP 6/22/99	DRAWING NUMBER 9843-23.DWG

FILE 9843-23.DWG CLOSED: 6/22/99 AT 7:50 AM

DRAWN BY	MSN	CHECKED BY	APPROVED BY	GP	6/22/99	DRAWING NUMBER
	3/16/99					9843-24.DWG

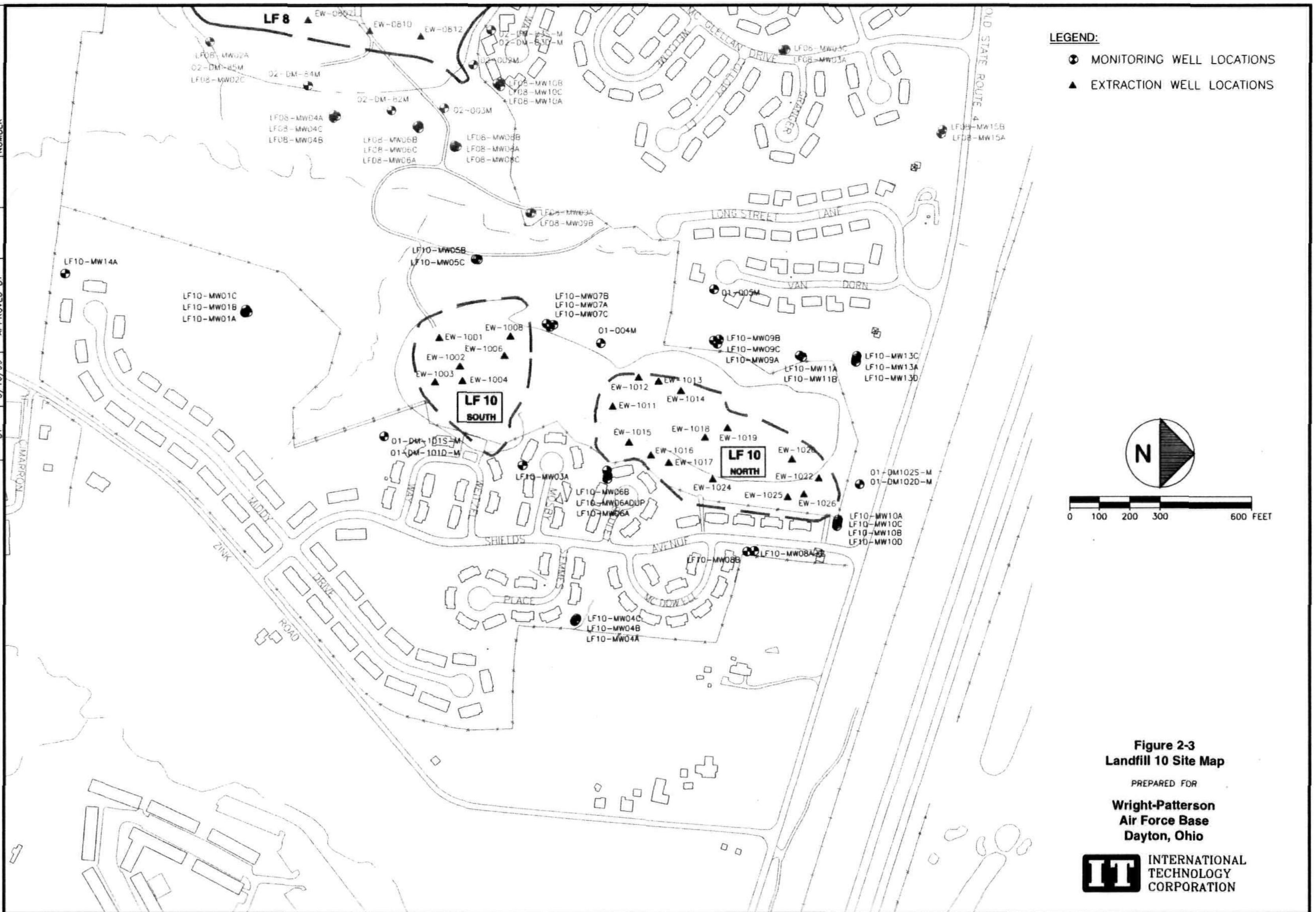


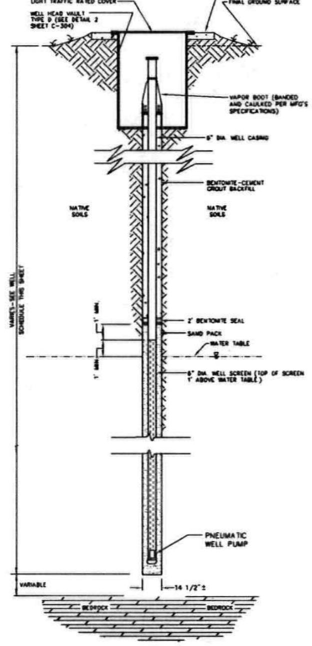
Figure 2-3
Landfill 10 Site Map

PREPARED FOR

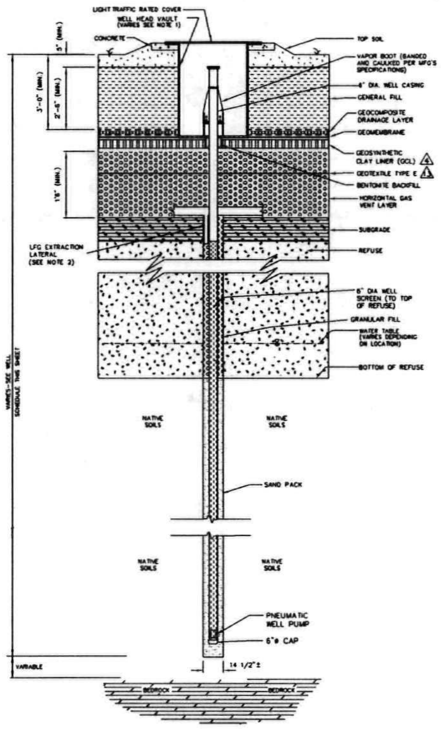
Wright-Patterson
Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

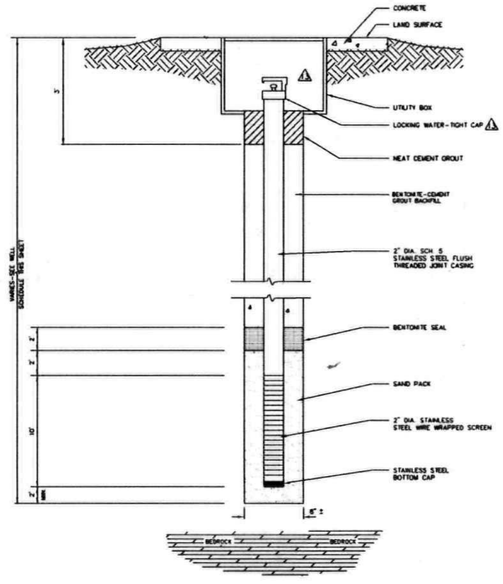
FILE 9843-24.DWG CLOSED: 6/22/99 AT 7:53 AM



TYPICAL EXTERIOR LEACHATE COLLECTION WELL
NOT TO SCALE
A / C-302 C-300, C-301



TYPICAL INTERIOR LEACHATE AND GAS COLLECTION WELL
NOT TO SCALE
B / C-302 C-300, C-301, C-200, C-201, E-4



TYPICAL BEDROCK MONITORING WELL
NOT TO SCALE
C / C-302 C-300, C-301

NOTES:
1. SEE EXTRACTION WELL SCHEDULE (THIS SHEET) AND SHEETS C-302 AND C-303 FOR DETAILS OF WELL HEAD VAULT TYPES.
2. SEE SHEET C-202 FOR DETAIL OF LFG EXTRACTION LATERAL.

Revisions			
Symbol	Description	Date	Approved
Δ	RECORD DRAWING	3/3/98	W.H.S.
Δ4	SOIL BARRIER LAYER CHANGED TO GEOSYNTHETIC CLAY LINER (GCL)	05/03/95	W.H.S.
Δ1	ISSUED FOR CONSTRUCTION	10/20/94	W.H.S.
Δ0	ISSUED FOR BID	7/7/94	W.H.S.

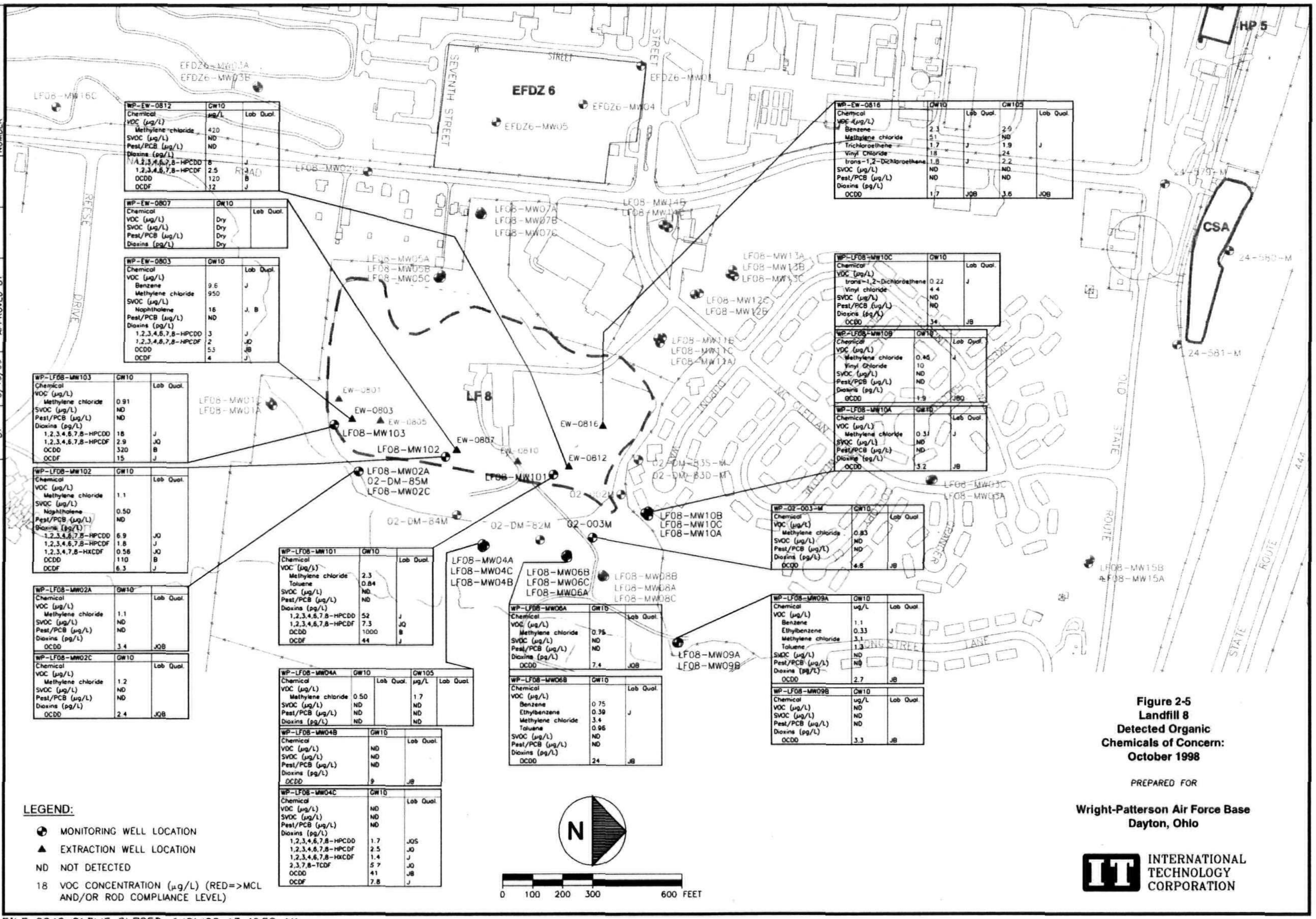
IT CORPORATION
CINCINNATI, OHIO

88th AIR BASE WING
OFFICE OF ENVIRONMENTAL MANAGEMENT
WRIGHT-PATTERSON AFB, OHIO

WRIGHT-PATTERSON AFB, OHIO
SOURCE CONTROL OPERABLE UNIT
LANDFILLS 8 AND 10

LEACHATE COLLECTION SYSTEM DETAILS
FIGURE 2-4

Designed by: G.A.H.	
Drawn by: M.S.N.	
Checked by: J.M.M.	
Reviewed by: J.M.M.	Scale N.T.S.
Approved by: W.H.S.	Date: 7-7-94
	Drawing Code
Sheet reference number: C-302	Sheet 45 of 75



WP-EW-0812	GW10	
Chemical	µg/L	Lab Qual.
VOC (µg/L)		
Methylene chloride	420	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
1,2,3,4,6,7,8-HPCDD	8	J
1,2,3,4,6,7,8-HPCDF	2.5	J
OCDD	120	B
OCDF	12	J

WP-EW-0807	GW10	
Chemical		Lab Qual.
VOC (µg/L)	Dry	
SVOC (µg/L)	Dry	
Pest/PCB (µg/L)	Dry	
Dioxins (pg/L)	Dry	

WP-EW-0803	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Benzene	9.6	J
Methylene chloride	950	
SVOC (µg/L)		
Naphthalene	16	J, B
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
1,2,3,4,6,7,8-HPCDD	3	J
1,2,3,4,6,7,8-HPCDF	2	JQ
OCDD	53	JB
OCDF	4	J

WP-LF08-MW103	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Methylene chloride	0.91	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
1,2,3,4,6,7,8-HPCDD	18	J
1,2,3,4,6,7,8-HPCDF	2.9	JQ
OCDD	320	B
OCDF	15	J

WP-LF08-MW102	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Methylene chloride	1.1	
SVOC (µg/L)		
Naphthalene	0.50	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
1,2,3,4,6,7,8-HPCDD	6.9	JQ
1,2,3,4,6,7,8-HPCDF	1.8	J
1,2,3,4,7,8-HXCDF	0.56	JQ
OCDD	110	B
OCDF	6.3	J

WP-LF08-MW02A	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Methylene chloride	1.1	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	3.4	JQB

WP-LF08-MW02C	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Methylene chloride	1.2	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	2.4	JQB

WP-LF08-MW101	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Methylene chloride	2.3	
Toluene	0.84	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
1,2,3,4,6,7,8-HPCDD	52	J
1,2,3,4,6,7,8-HPCDF	7.3	JQ
OCDD	1000	B
OCDF	44	J

WP-LF08-MW04A	GW10		GW105	
Chemical		Lab Qual.	µg/L	Lab Qual.
VOC (µg/L)				
Methylene chloride	0.50		1.7	
SVOC (µg/L)	ND		ND	
Pest/PCB (µg/L)	ND		ND	
Dioxins (pg/L)	ND		ND	

WP-LF08-MW04B	GW10	
Chemical		Lab Qual.
VOC (µg/L)	ND	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	9	JB

WP-LF08-MW04C	GW10	
Chemical		Lab Qual.
VOC (µg/L)	ND	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
1,2,3,4,6,7,8-HPCDD	1.7	JQS
1,2,3,4,6,7,8-HPCDF	2.5	JQ
1,2,3,4,6,7,8-HXCDF	1.4	J
2,3,7,8-TCDF	5.7	JQ
OCDD	41	JB
OCDF	7.8	J

WP-LF08-MW06A	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Methylene chloride	0.75	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	7.4	JQB

WP-LF08-MW06B	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Benzene	0.75	
Ethylbenzene	0.39	J
Methylene chloride	3.4	
Toluene	0.96	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	24	JB

WP-EW-0816	GW10		GW105	
Chemical		Lab Qual.		Lab Qual.
VOC (µg/L)				
Benzene	2.3		2.9	
Methylene chloride	51		ND	
Trichloroethene	1.7	J	1.9	J
Vinyl Chloride	18		24	
trans-1,2-Dichloroethene	1.8	J	2.2	
SVOC (µg/L)	ND		ND	
Pest/PCB (µg/L)	ND		ND	
Dioxins (pg/L)				
OCDD	1.7	JQB	3.6	JQB

WP-LF08-MW10C	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
trans-1,2-Dichloroethene	0.22	J
Vinyl chloride	4.4	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	34	JB

WP-LF08-MW10B	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Methylene chloride	0.46	J
Vinyl Chloride	10	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	1.9	JBQ

WP-LF08-MW10A	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Methylene chloride	0.31	J
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	3.2	JB

WP-02-003-M	GW10	
Chemical		Lab Qual.
VOC (µg/L)		
Methylene chloride	0.83	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	4.8	JB

WP-LF08-MW09A	GW10	
Chemical	ug/L	Lab Qual.
VOC (µg/L)		
Benzene	1.1	
Ethylbenzene	0.33	J
Methylene chloride	3.1	
Toluene	1.3	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	2.7	JB

WP-LF08-MW09B	GW10	
Chemical	ug/L	Lab Qual.
VOC (µg/L)	ND	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxins (pg/L)		
OCDD	3.3	JB

LEGEND:

- MONITORING WELL LOCATION
- ▲ EXTRACTION WELL LOCATION
- ND NOT DETECTED
- 18 VOC CONCENTRATION (µg/L) (RED=>MCL AND/OR ROD COMPLIANCE LEVEL)

Figure 2-5
Landfill 8
Detected Organic Chemicals of Concern: October 1998

PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

FILE 9843-21.DWG CLOSED: 6/21/99 AT 10:52 AM

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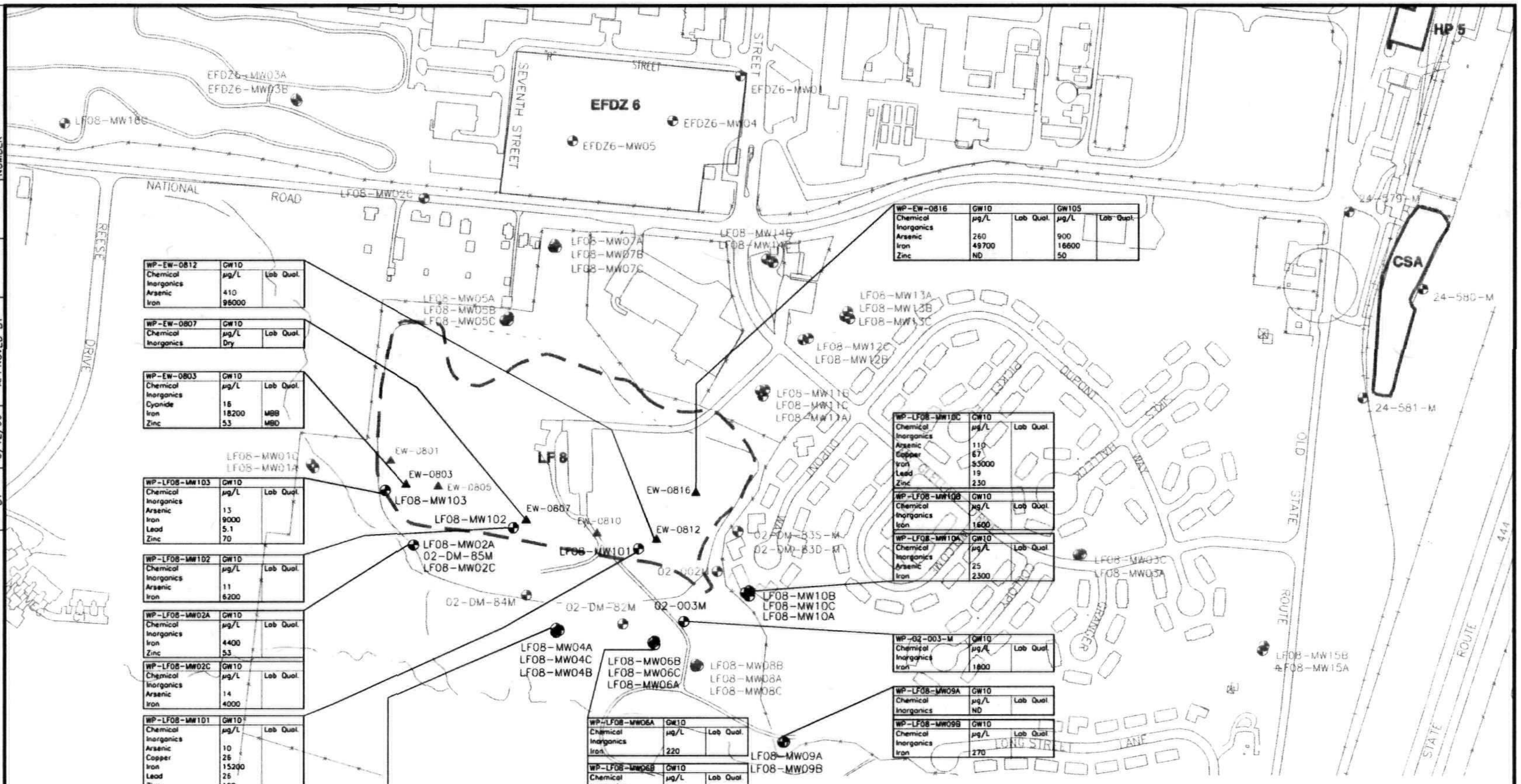

WP-EW-0812	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Arsenic	410	
Iron	96000	

WP-EW-0807	GW10	
Chemical Inorganics	µg/L	Lab Qual.
	Dry	

WP-EW-0803	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Cyanide	16	
Iron	18200	MBB
Zinc	53	MBD

WP-LF08-MW103	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Arsenic	13	
Iron	9000	
Lead	5.1	
Zinc	70	

WP-LF08-MW102	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Arsenic	11	
Iron	6200	

WP-LF08-MW02A	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Iron	4400	
Zinc	53	

WP-LF08-MW02C	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Arsenic	14	
Iron	4000	

WP-LF08-MW101	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Arsenic	10	
Copper	26	
Iron	15200	
Lead	26	
Zinc	100	

WP-LF08-MW04A	GW10		GW105	
Chemical Inorganics	µg/L	Lab Qual.	µg/L	Lab Qual.
Arsenic	22		23	
Iron	1400		1300	

WP-LF08-MW04B	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Arsenic	18	
Iron	1200	

WP-LF08-MW04C	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Iron	1700	

WP-LF08-MW06A	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Iron	220	

WP-LF08-MW06B	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Arsenic	49	

WP-EW-0816	GW10		GW105	
Chemical Inorganics	µg/L	Lab Qual.	µg/L	Lab Qual.
Arsenic	260		900	
Iron	49700		16600	
Zinc	ND		50	

WP-LF08-MW10C	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Arsenic	110	
Copper	67	
Iron	53000	
Lead	19	
Zinc	230	

WP-LF08-MW10B	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Iron	1600	

WP-LF08-MW10A	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Arsenic	25	
Iron	2300	

WP-02-003-M	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Iron	1800	

WP-LF08-MW09A	GW10	
Chemical Inorganics	µg/L	Lab Qual.
	ND	

WP-LF08-MW09B	GW10	
Chemical Inorganics	µg/L	Lab Qual.
Iron	270	

LEGEND:

- MONITORING WELL LOCATION
- EXTRACTION WELL LOCATION
- ND NOT DETECTED
- 18 VOC CONCENTRATION (µg/L) (RED=>MCL AND/OR ROD COMPLIANCE LEVEL)

N

0 100 200 300 600 FEET

Figure 2-6
Landfill 8
Detected Inorganic Chemicals of Concern: October 1998

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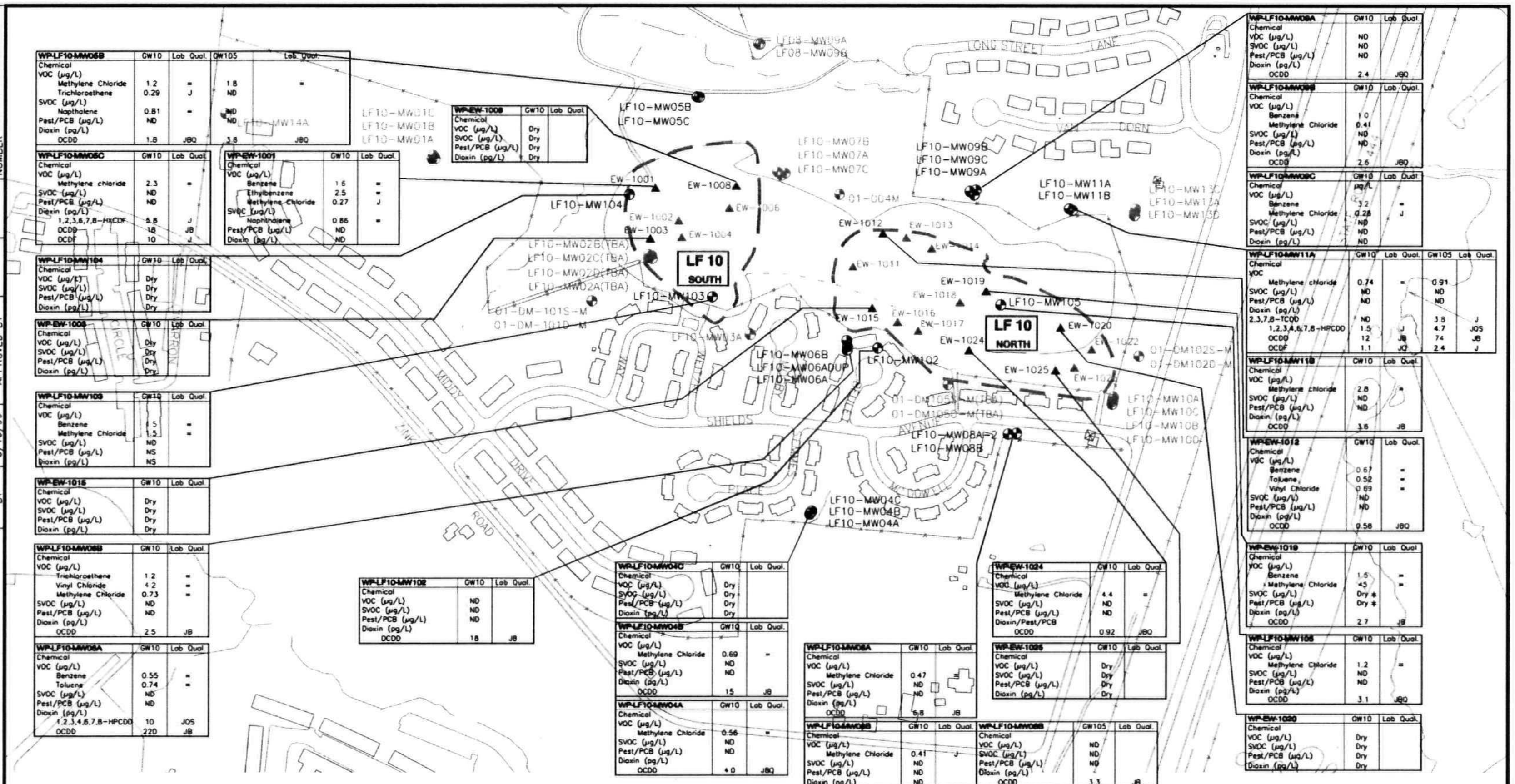
FILE 9843-17.DWG CLOSED: 6/21/99 AT 8:53 AM



WP-LF10-MW05B	GW10	Lab Qual.	GW105	Lab Qual.
Chemical				
VOC (µg/L)				
Methylene Chloride	1.2	=	1.8	=
Trichloroethene	0.29	J	ND	
SVOC (µg/L)				
Napthalene	0.81	=	ND	
Pest/PCB (µg/L)	ND		ND	
Dioxin (pg/L)				
OCDD	1.8	JBQ	3.8	JBQ

WP-EW-1008	GW10	Lab Qual.
Chemical		
VOC (µg/L)	Dry	
SVOC (µg/L)	Dry	
Pest/PCB (µg/L)	Dry	
Dioxin (pg/L)	Dry	

WP-LF10-MW05C	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Methylene chloride	2.3	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
1,2,3,6,7,8-HXCDF	5.8	J
OCDD	18	JB
OCDF	10	J

WP-EW-1001	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Benzene	1.6	=
Ethylbenzene	2.5	=
Methylene Chloride	0.27	J
SVOC (µg/L)		
Naphthalene	0.86	=
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)	ND	

WP-LF10-MW104	GW10	Lab Qual.
Chemical		
VOC (µg/L)	Dry	
SVOC (µg/L)	Dry	
Pest/PCB (µg/L)	Dry	
Dioxin (pg/L)	Dry	

WP-EW-1003	GW10	Lab Qual.
Chemical		
VOC (µg/L)	Dry	
SVOC (µg/L)	Dry	
Pest/PCB (µg/L)	Dry	
Dioxin (pg/L)	Dry	

WP-LF10-MW103	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Benzene	1.5	=
Methylene Chloride	1.5	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	NS	
Dioxin (pg/L)	NS	

WP-EW-1015	GW10	Lab Qual.
Chemical		
VOC (µg/L)	Dry	
SVOC (µg/L)	Dry	
Pest/PCB (µg/L)	Dry	
Dioxin (pg/L)	Dry	

WP-LF10-MW06B	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Trichloroethene	1.2	=
Vinyl Chloride	4.2	=
Methylene Chloride	0.73	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	2.5	JB

WP-LF10-MW06A	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Benzene	0.55	=
Toluene	0.74	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
1,2,3,4,6,7,8-HPCDD	10	JQS
OCDD	220	JB

WP-LF10-MW102	GW10	Lab Qual.
Chemical		
VOC (µg/L)	ND	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	18	JB

WP-LF10-MW04C	GW10	Lab Qual.
Chemical		
VOC (µg/L)	Dry	
SVOC (µg/L)	Dry	
Pest/PCB (µg/L)	Dry	
Dioxin (pg/L)	Dry	

WP-LF10-MW04B	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Methylene Chloride	0.69	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	15	JB

WP-LF10-MW04A	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Methylene Chloride	0.56	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	4.0	JBQ

WP-LF10-MW08A	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Methylene Chloride	0.47	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	6.8	JB

WP-LF10-MW08B	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Methylene Chloride	0.41	J
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)	ND	

WP-LF10-MW08B	GW105	Lab Qual.
Chemical		
VOC (µg/L)	ND	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	3.3	JB

WP-EW-1024	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Methylene Chloride	4.4	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin/Pest/PCB		
OCDD	0.92	JBQ

WP-EW-1025	GW10	Lab Qual.
Chemical		
VOC (µg/L)	Dry	
SVOC (µg/L)	Dry	
Pest/PCB (µg/L)	Dry	
Dioxin (pg/L)	Dry	

WP-LF10-MW09A	GW10	Lab Qual.
Chemical		
VOC (µg/L)	ND	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	2.4	JBQ

WP-LF10-MW09B	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Benzene	1.0	
Methylene Chloride	0.41	
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	2.6	JBQ

WP-LF10-MW09C	GW10	Lab Qual.
Chemical	µg/L	
VOC (µg/L)		
Benzene	3.2	=
Methylene Chloride	0.28	J
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)	ND	

WP-LF10-MW11A	GW10	Lab Qual.	GW105	Lab Qual.
Chemical				
VOC				
Methylene chloride	0.74	=	0.91	
SVOC (µg/L)	ND		ND	
Pest/PCB (µg/L)	ND		ND	
Dioxin (pg/L)				
2,3,7,8-TCDD	ND		3.8	J
1,2,3,4,6,7,8-HPCDD	1.5	J	4.7	JQS
OCDD	12	JB	74	JB
OCDF	1.1	JQ	2.4	J

WP-LF10-MW11B	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Methylene chloride	2.8	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	3.6	JB

WP-EW-1012	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Benzene	0.67	=
Toluene	0.52	=
Vinyl Chloride	0.69	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	0.58	JBQ

WP-EW-1019	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Benzene	1.5	=
Methylene Chloride	45	=
SVOC (µg/L)	Dry *	
Pest/PCB (µg/L)	Dry *	
Dioxin (pg/L)		
OCDD	2.7	JB

WP-LF10-MW105	GW10	Lab Qual.
Chemical		
VOC (µg/L)		
Methylene Chloride	1.2	=
SVOC (µg/L)	ND	
Pest/PCB (µg/L)	ND	
Dioxin (pg/L)		
OCDD	3.1	JBQ

WP-EW-1020	GW10	Lab Qual.
Chemical		
VOC (µg/L)	Dry	
SVOC (µg/L)	Dry	
Pest/PCB (µg/L)	Dry	
Dioxin (pg/L)	Dry	

LEGEND:

- MONITORING WELL LOCATION
- ▲ EXTRACTION WELL LOCATION
- ND NOT DETECTED
- NS NOT SAMPLED

pg/L = 1×10^{12} µg/L

4.2 VOC CONCENTRATION (µg/L)(RED=>MCL AND/OR ROD COMPLIANCE LEVEL)

* EXTRACTION WELL EW-1019 WENT DRY DURING SAMPLING

N

0 100 200 300 600 FEET

Figure 2-7
Landfill 10
Detected Organic
Chemicals of Concern:
October 1998

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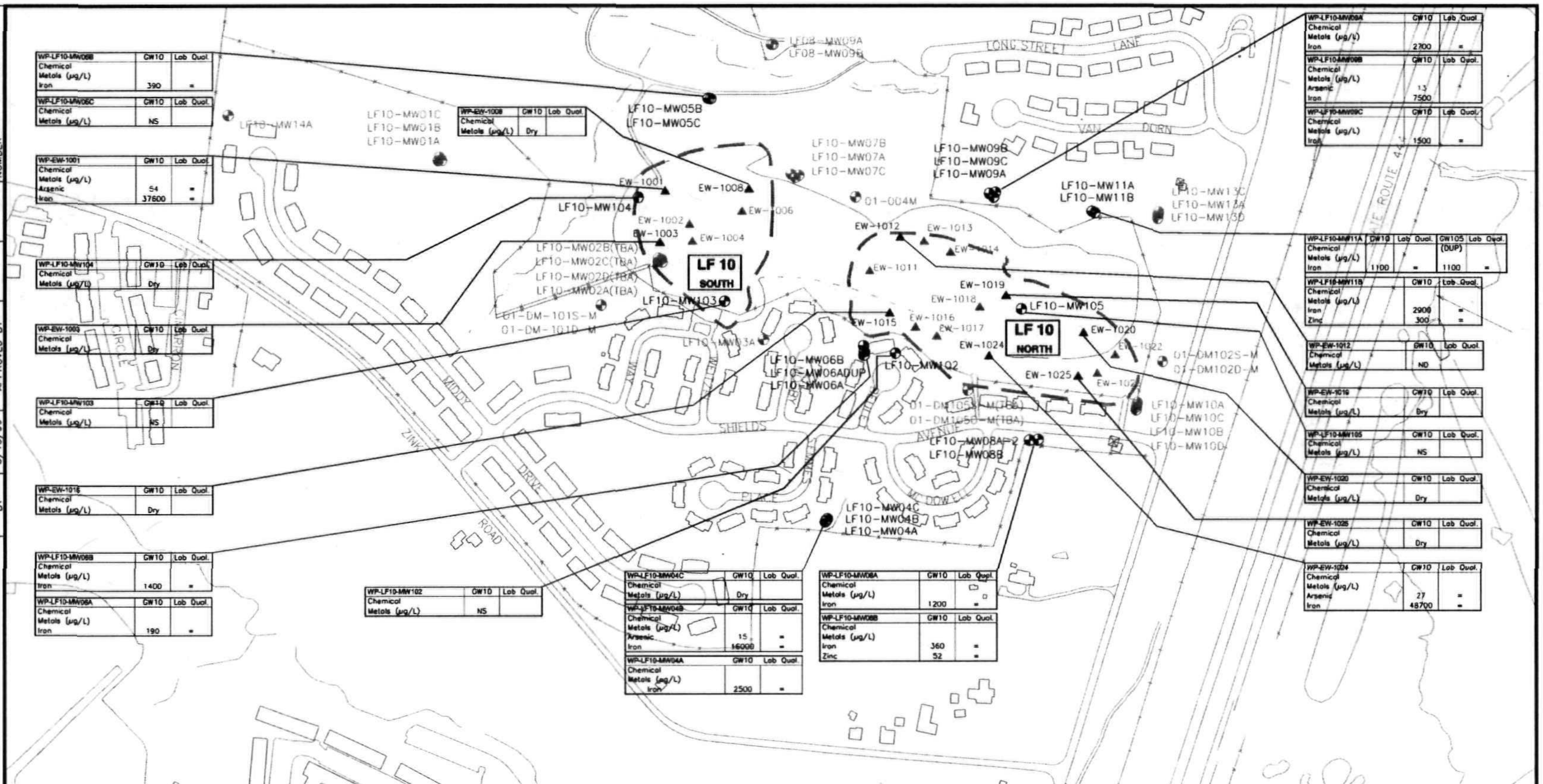

WP-LF10-MW05B	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Iron	390	=

WP-LF10-MW05C	GW10	Lab Qual.
Chemical		
Metals (µg/L)	NS	

WP-EW-1008	GW10	Lab Qual.
Chemical		
Metals (µg/L)	Dry	

WP-EW-1001	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Arsenic	54	=
Iron	37600	=

WP-LF10-MW104	GW10	Lab Qual.
Chemical		
Metals (µg/L)	Dry	

WP-EW-1003	GW10	Lab Qual.
Chemical		
Metals (µg/L)	Dry	

WP-LF10-MW103	GW10	Lab Qual.
Chemical		
Metals (µg/L)	NS	

WP-EW-1015	GW10	Lab Qual.
Chemical		
Metals (µg/L)	Dry	

WP-LF10-MW06B	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Iron	1400	=

WP-LF10-MW06A	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Iron	190	=

WP-LF10-MW102	GW10	Lab Qual.
Chemical		
Metals (µg/L)	NS	

WP-LF10-MW04C	GW10	Lab Qual.
Chemical		
Metals (µg/L)	Dry	

WP-LF10-MW04B	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Arsenic	15	=
Iron	16000	=

WP-LF10-MW04A	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Iron	2500	=

WP-LF10-MW08A	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Iron	1200	=

WP-LF10-MW08B	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Iron	360	=
Zinc	52	=

WP-LF10-MW09A	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Iron	2700	=

WP-LF10-MW09B	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Arsenic	13	
Iron	7500	

WP-LF10-MW09C	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Iron	1500	=

WP-LF10-MW11A	GW10	Lab Qual.	GW105 (DUP)	Lab Qual.
Chemical				
Metals (µg/L)				
Iron	1100	=	1100	=

WP-LF10-MW11B	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Iron	2900	=
Zinc	300	=

WP-EW-1012	GW10	Lab Qual.
Chemical		
Metals (µg/L)	ND	

WP-EW-1019	GW10	Lab Qual.
Chemical		
Metals (µg/L)	Dry	

WP-LF10-MW105	GW10	Lab Qual.
Chemical		
Metals (µg/L)	NS	

WP-EW-1020	GW10	Lab Qual.
Chemical		
Metals (µg/L)	Dry	

WP-EW-1025	GW10	Lab Qual.
Chemical		
Metals (µg/L)	Dry	

WP-EW-1024	GW10	Lab Qual.
Chemical		
Metals (µg/L)		
Arsenic	27	=
Iron	48700	=

LEGEND:

- MONITORING WELL LOCATION
- ▲ EXTRACTION WELL LOCATION
- ND NOT DETECTED
- NS NOT SAMPLED
- 4.2 INORGANIC CONCENTRATION (µg/L)(RED=>MCL AND/OR ROD COMPLIANCE LEVEL)

N

0 100 200 300 600 FEET

Figure 2-8
Landfill 10
Detected Inorganic
Chemicals of Concern:
October 1998

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Dayton, Ohio

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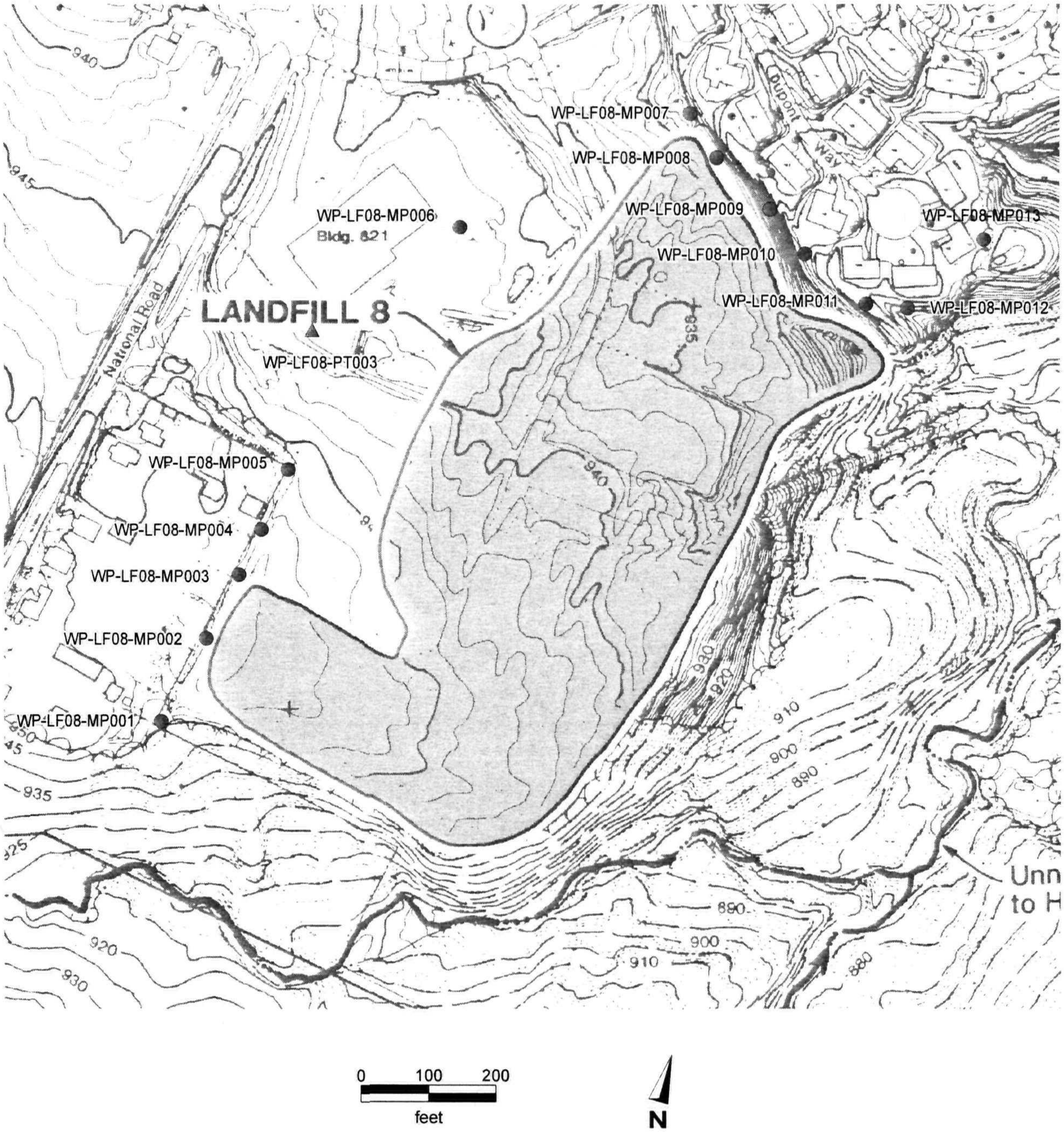

▲ WP-LF08-PT003 LFG Punchbar Location

● WP-LF08-MP005 LFG Monitoring Probe Location

Approximate Landfill Boundary

DRAWING BY	JIS, III	3/29/94
CHECKED BY	MWC	2/5/01
APPROVED BY	GDP	2/5/01
DRAWING NO.	S-322505-3-6-4-3/94-2	

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Figure 2-9. Landfill 8 Landfill Gas Monitoring Locations

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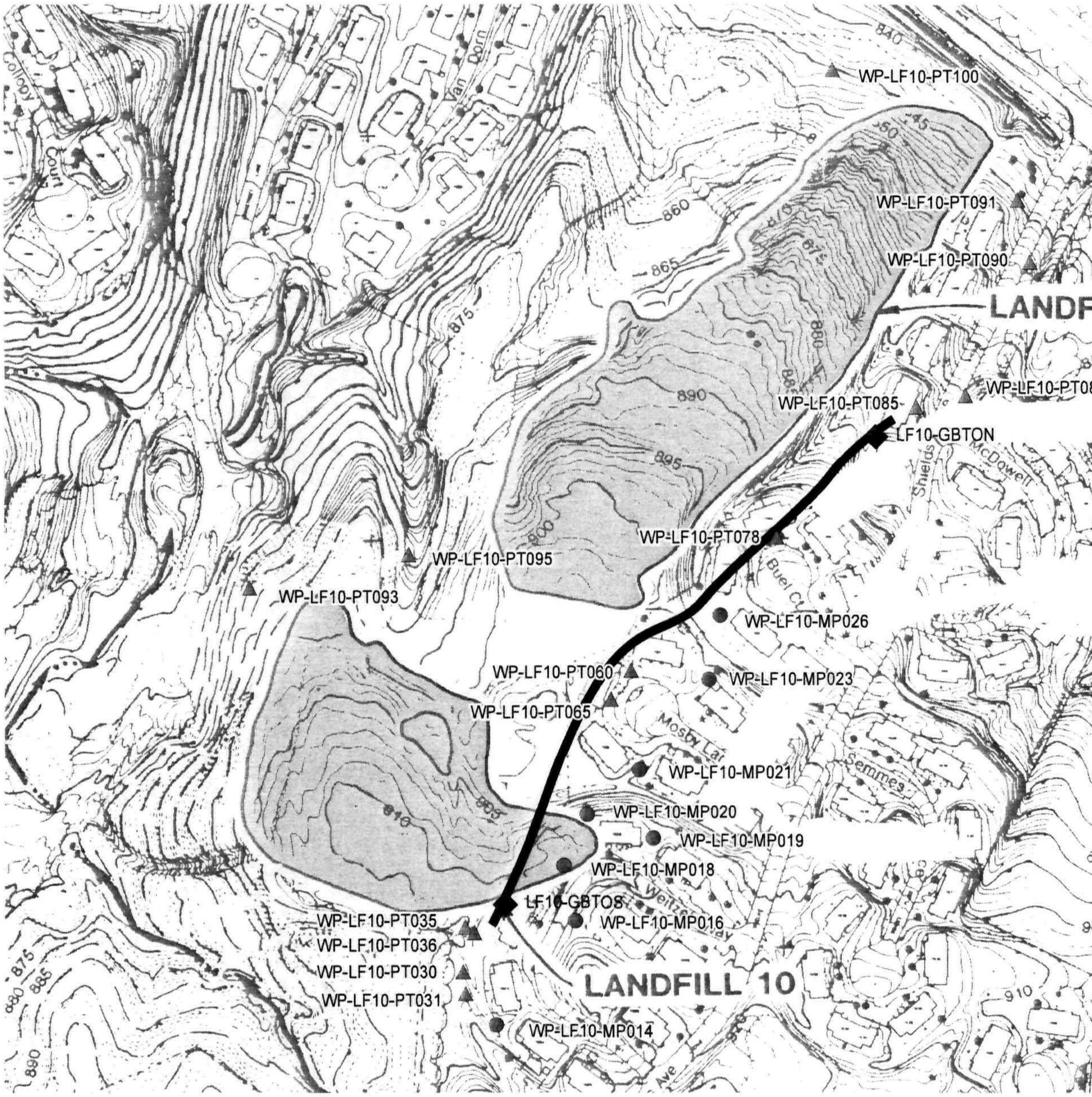

◆	LF10-GBTOS	Gas Barrier Trench Monitoring Point
▲	WP-LF10-PT100	LFG Punchbar
●	WP-LF10-MP014	LFG Monitoring Probe
—		Gas Barrier Trench
(shaded)		Approximate Landfill Boundary

0 100 200
feet

N

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Figure 2-10. Landfill 10 Landfill Gas Monitoring Locations

Prepared for
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Dayton, Ohio

DRAWING BY	CHECKED BY	APPROVED BY	DRAWING NO.
JIS,III 3/29/94	MWC 2/5/I	GDP 2/5/O	S-322505-3-6-4-3/94-2

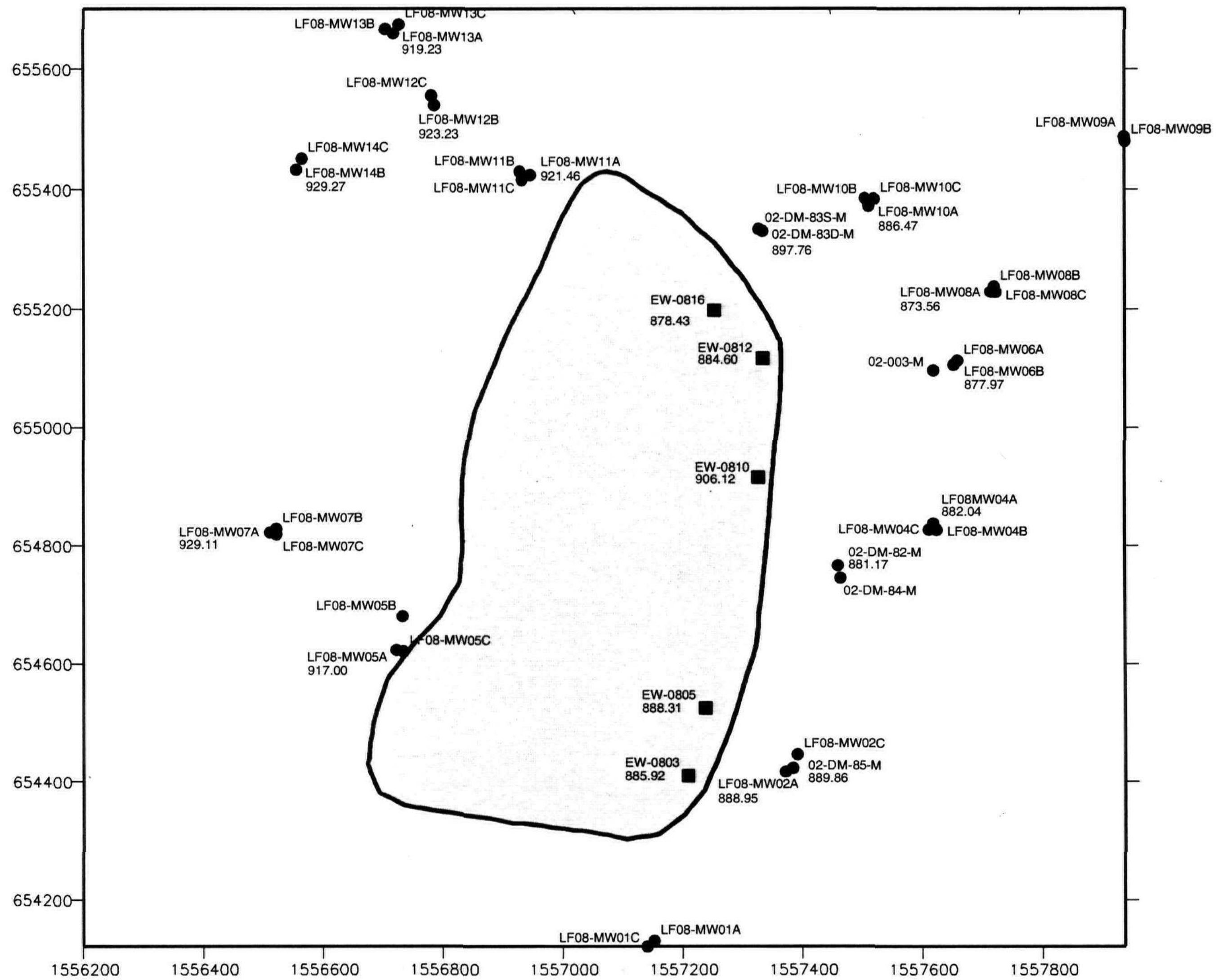

Figure 2-11

Landfill 8
Monitoring and Extraction Wells:
October 12, 1998

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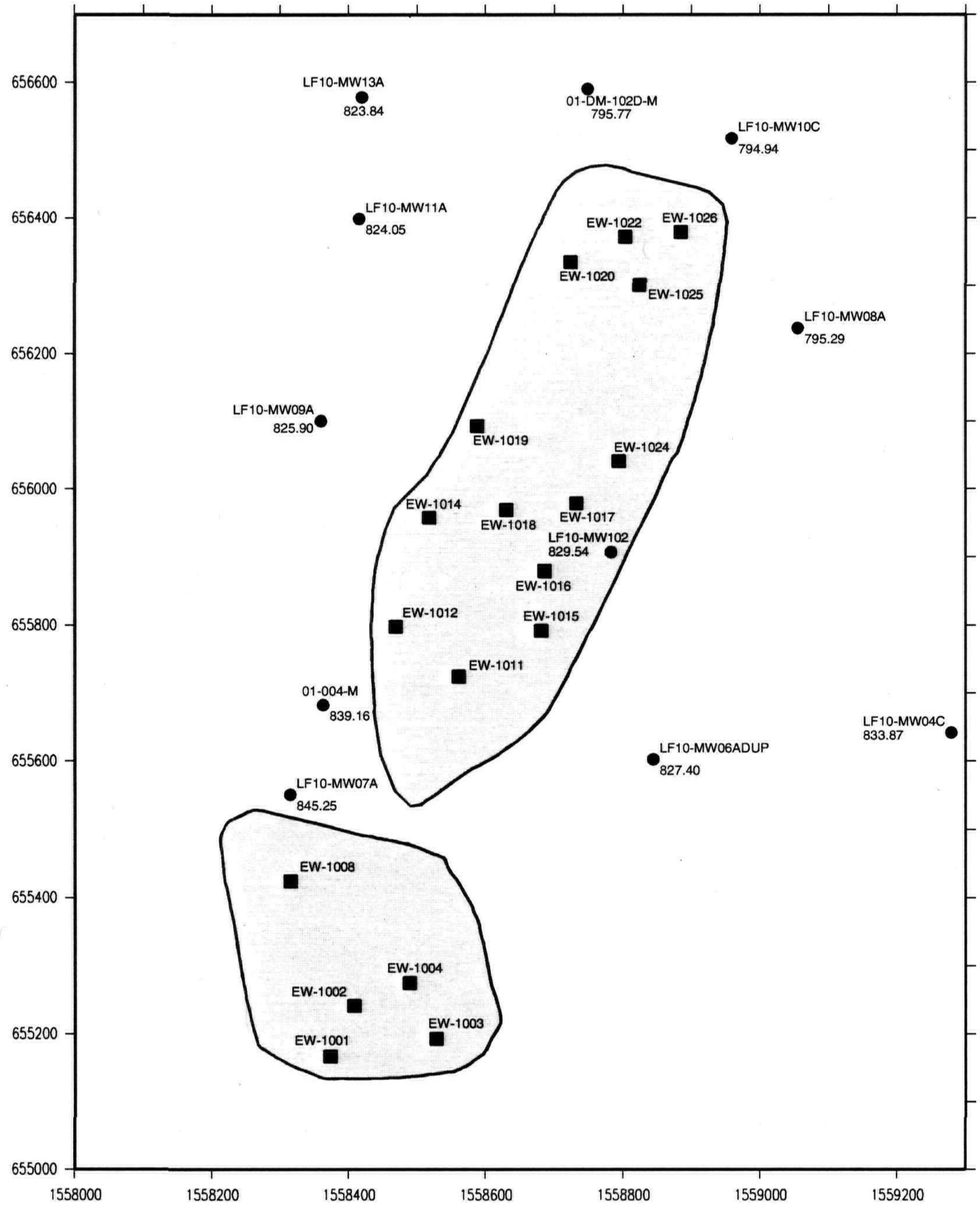

Figure 2-12

Landfill 10
Monitoring and Extraction Wells:
October 12, 1998

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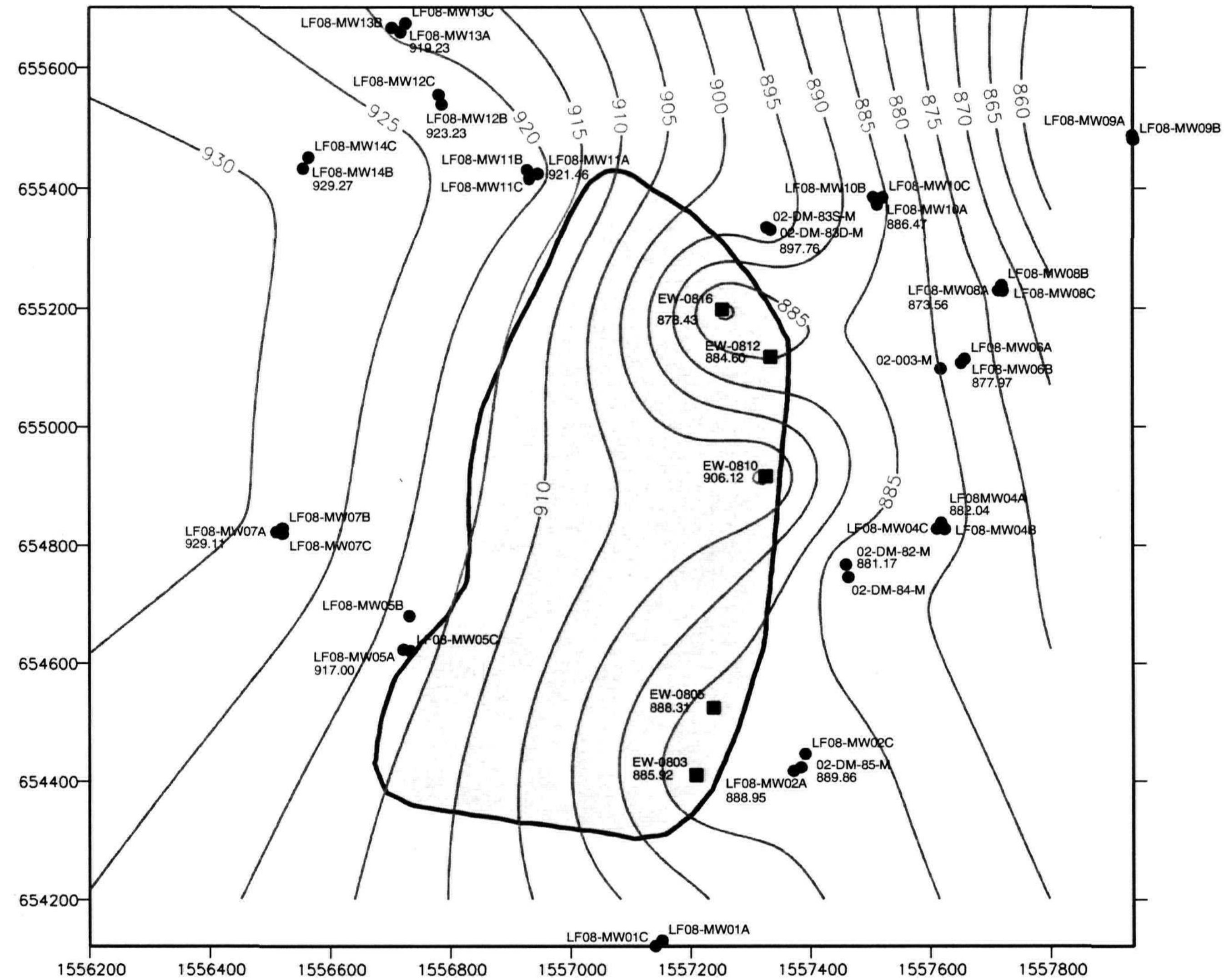

Figure 2-13

Landfill 8
Water Level Elevations
with Extraction Wells:
October 12, 1998

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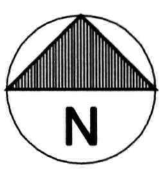

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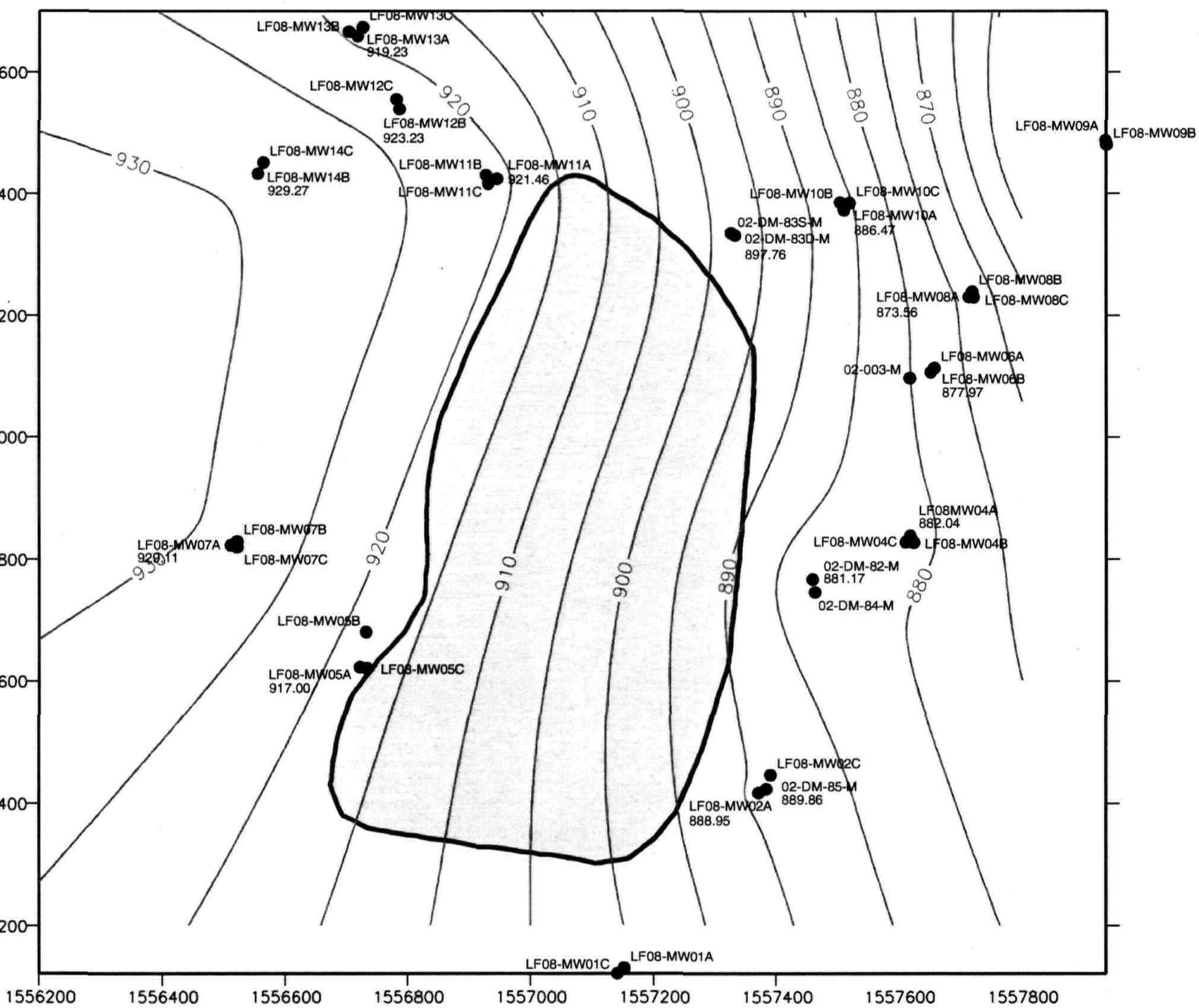

Figure 2-14

Landfill 8
Water Level Elevations
with No Extraction Wells:
October 12, 1998

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FILE 9843-37.DWG CLOSED: 7/28/99 AT 2:05 PM

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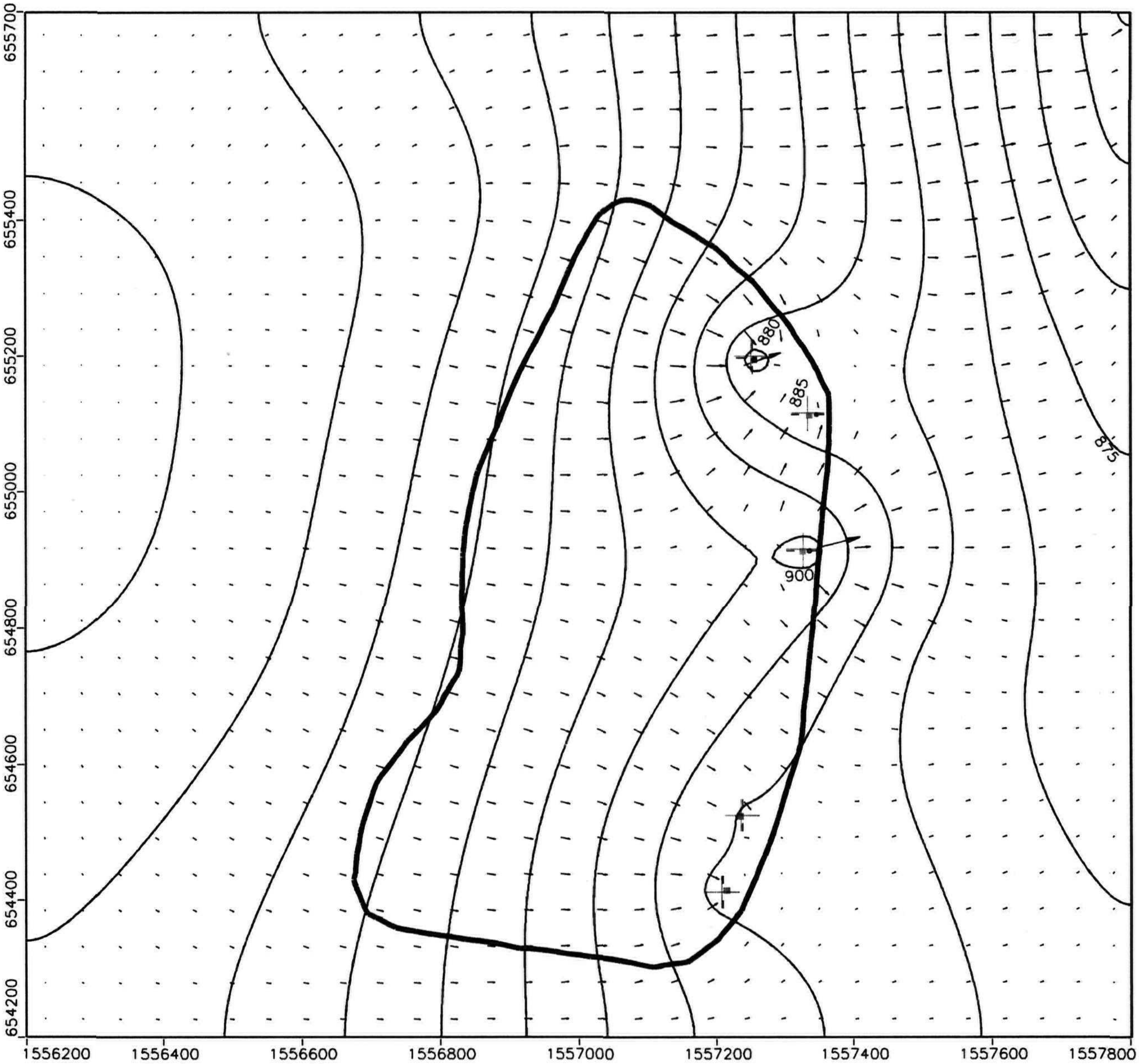

Figure 2-15

Landfill 8
Groundwater Velocity Vector Plot:
October 15, 1998

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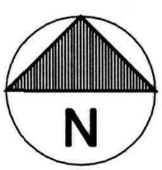

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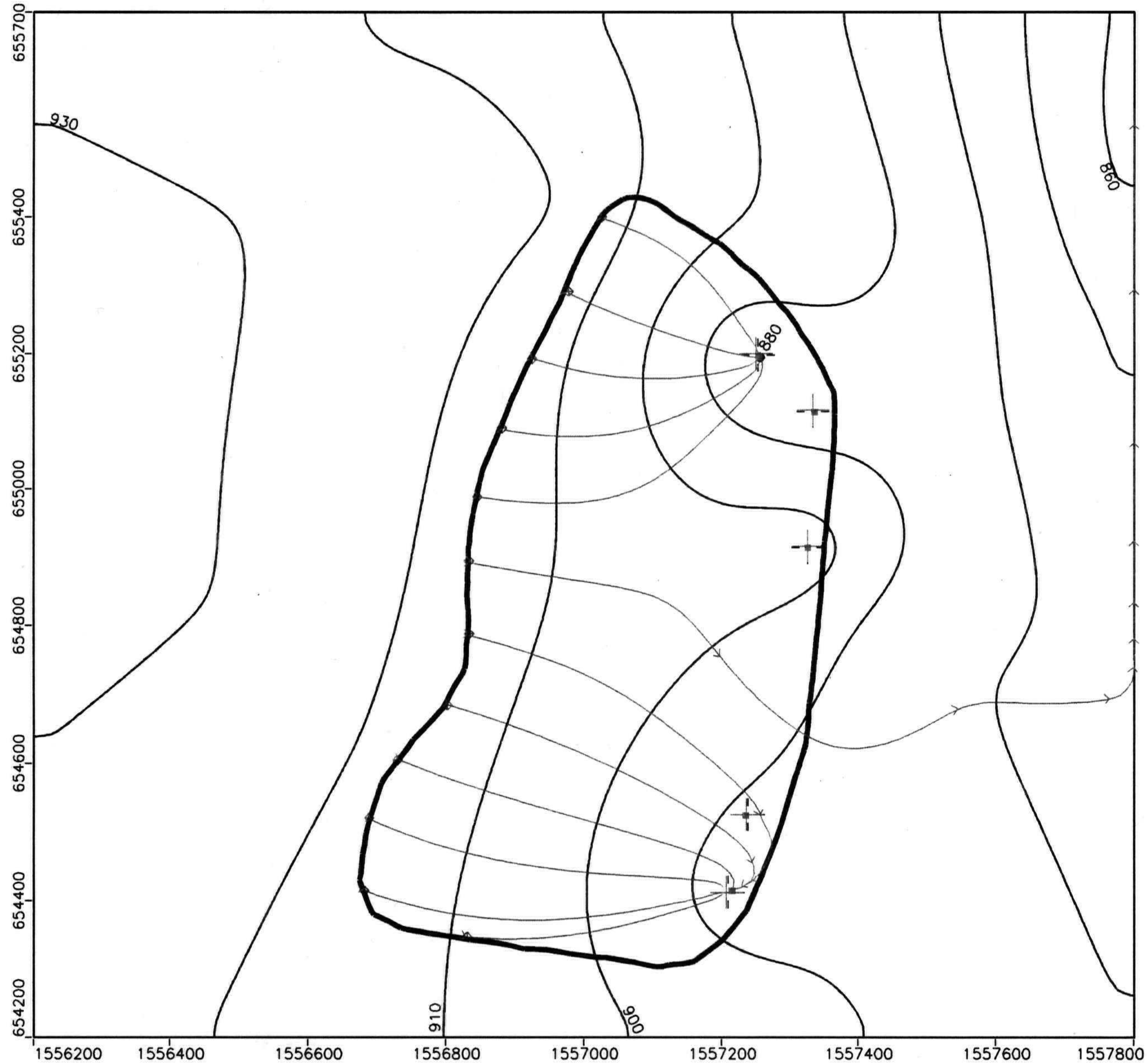

Figure 2-16

Landfill 8
Particle Tracking Plot:
October 15, 1998

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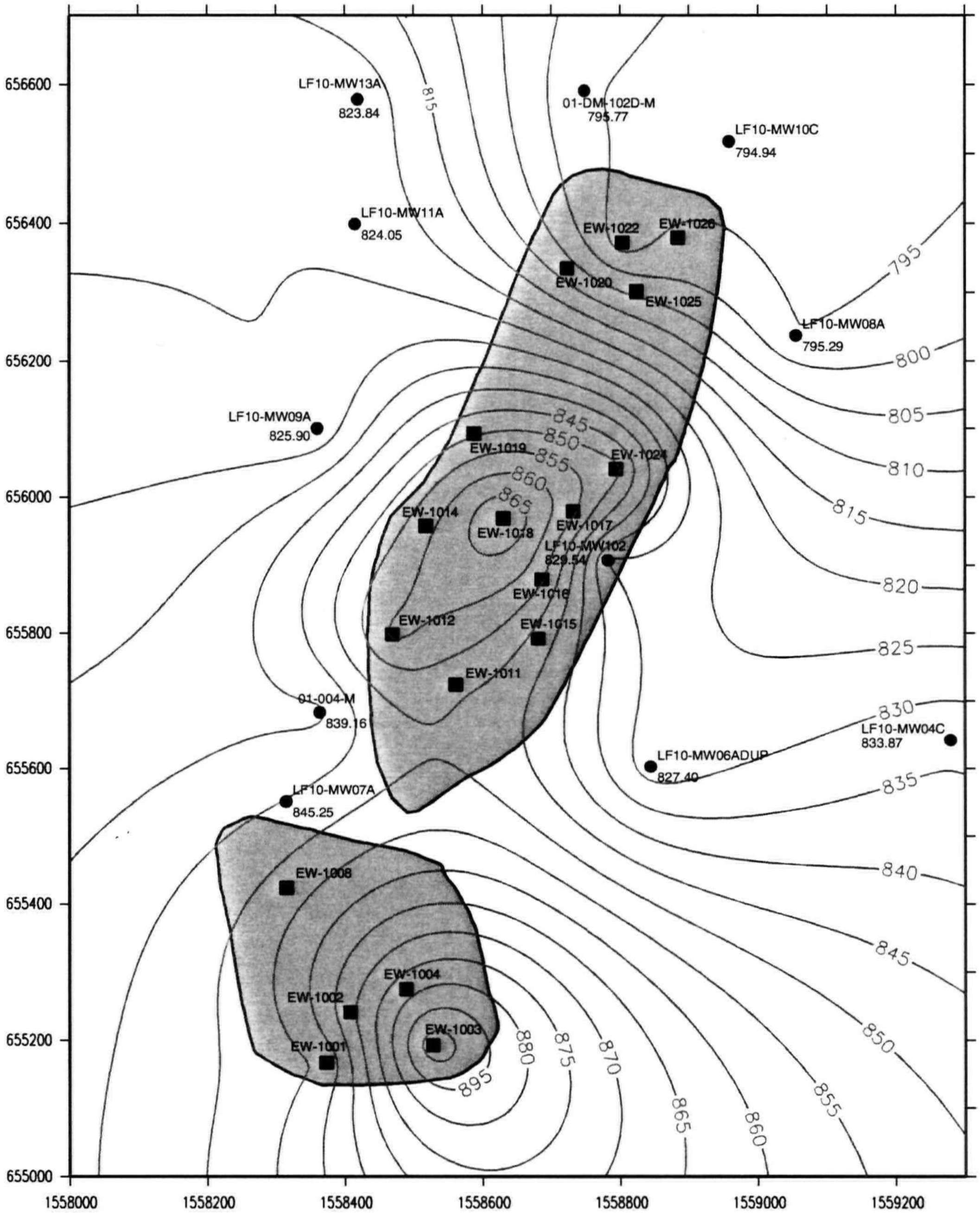

Figure 2-17

Landfill 10
Water Level Elevations
with Extraction Wells:
October 12, 1998

PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL
TECHNOLOGY
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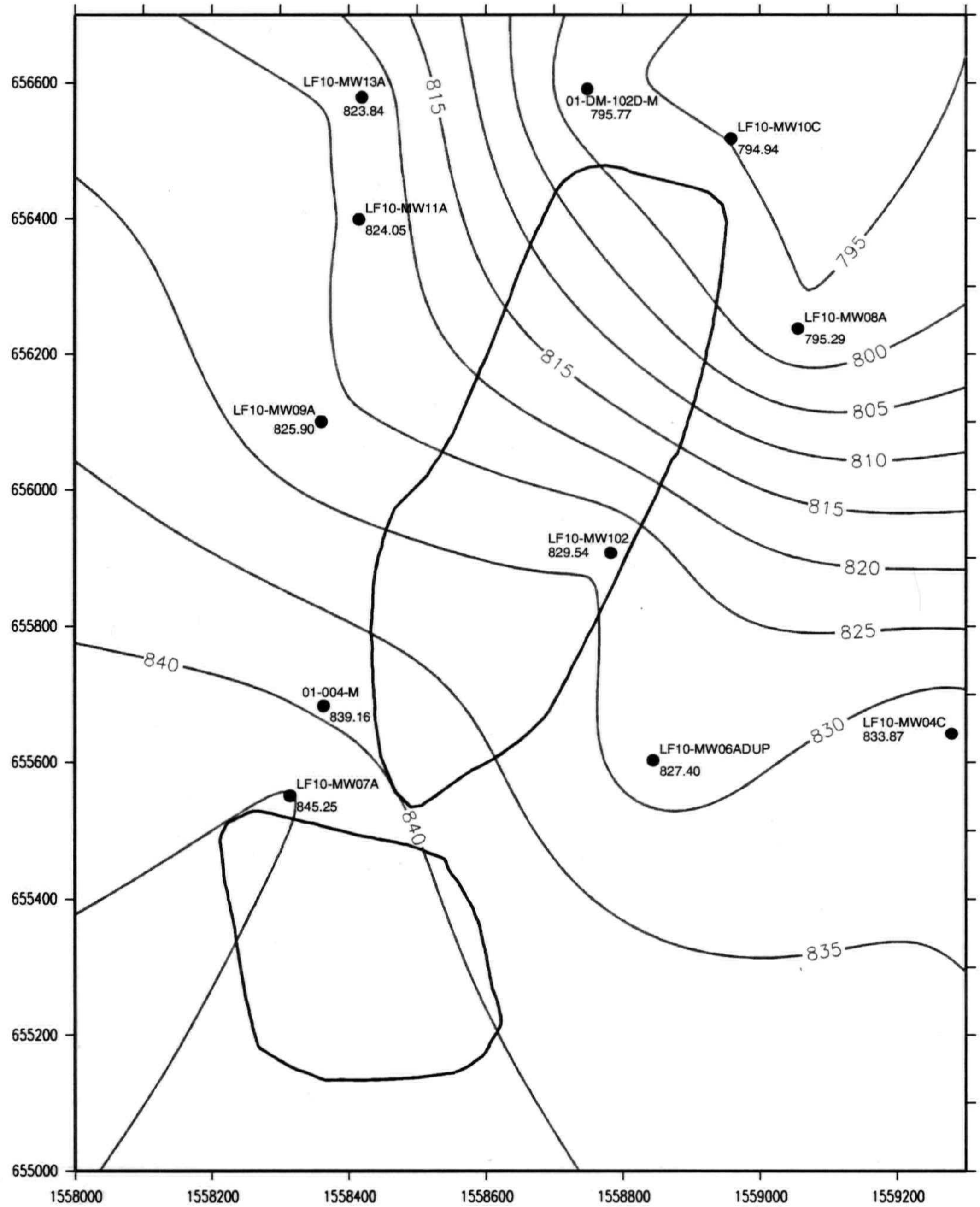

Figure 2-18

Landfill 10
Water Level Elevations
with No Extraction Wells:
October 12, 1998

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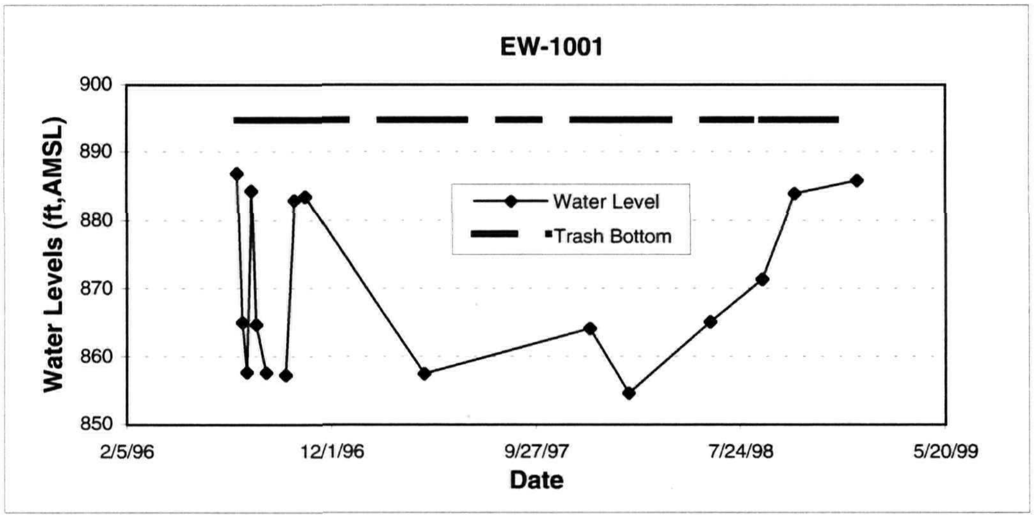
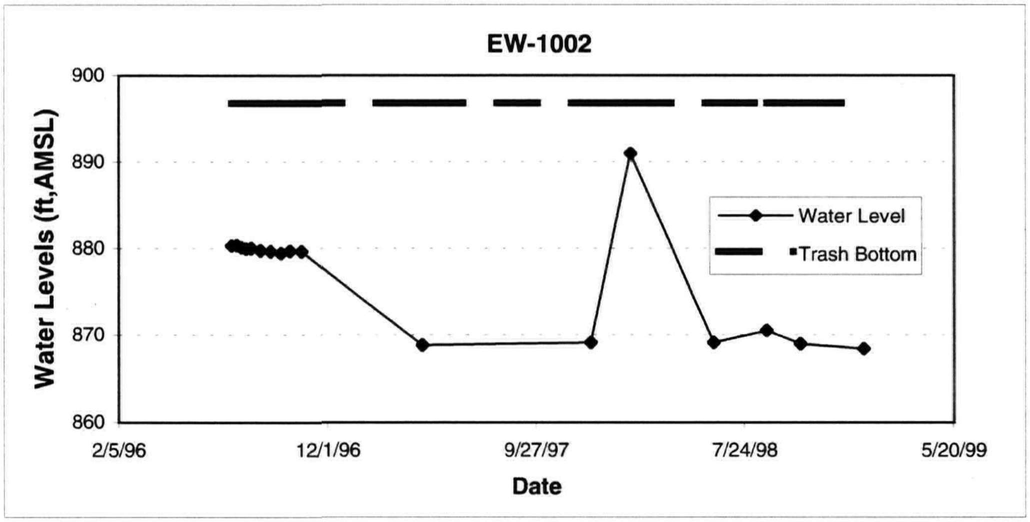
LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1001 and EW-1002
WPAFB - LTM Program

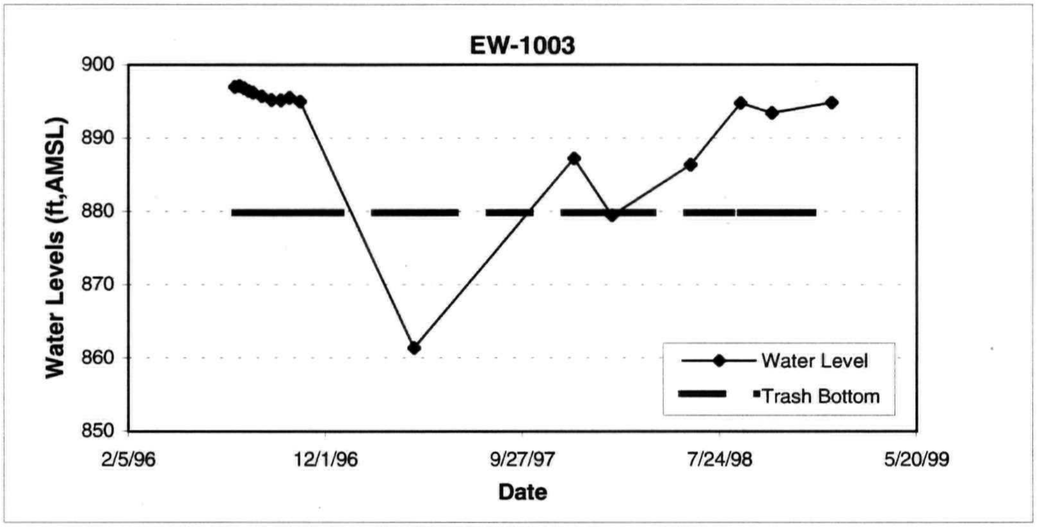


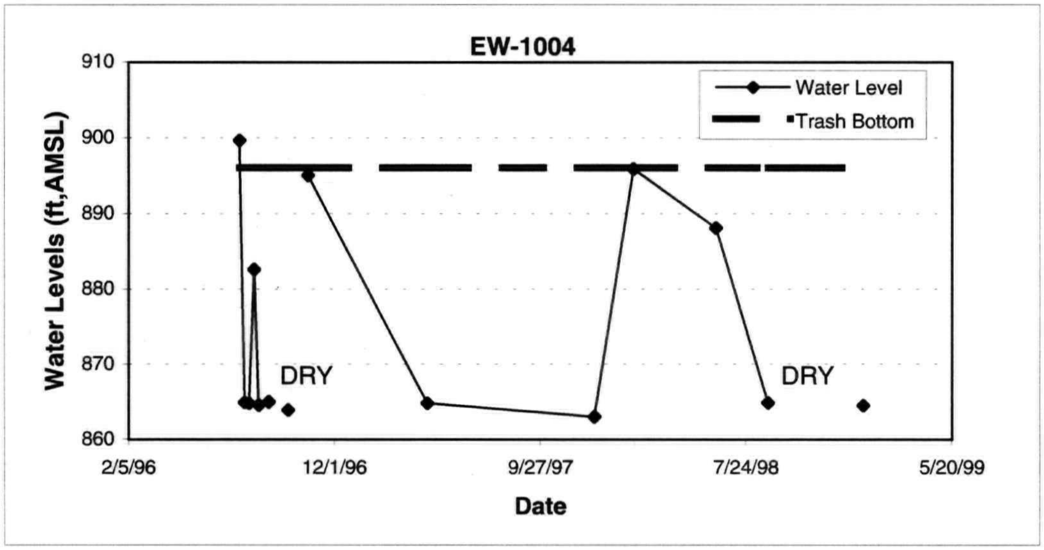


common3/Plamondo/Ltm/Figures/Oct98/O98lfgra.xls/1001-2

FIGURE 2-19

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1003 and EW-1004
WPAFB - LTM Program

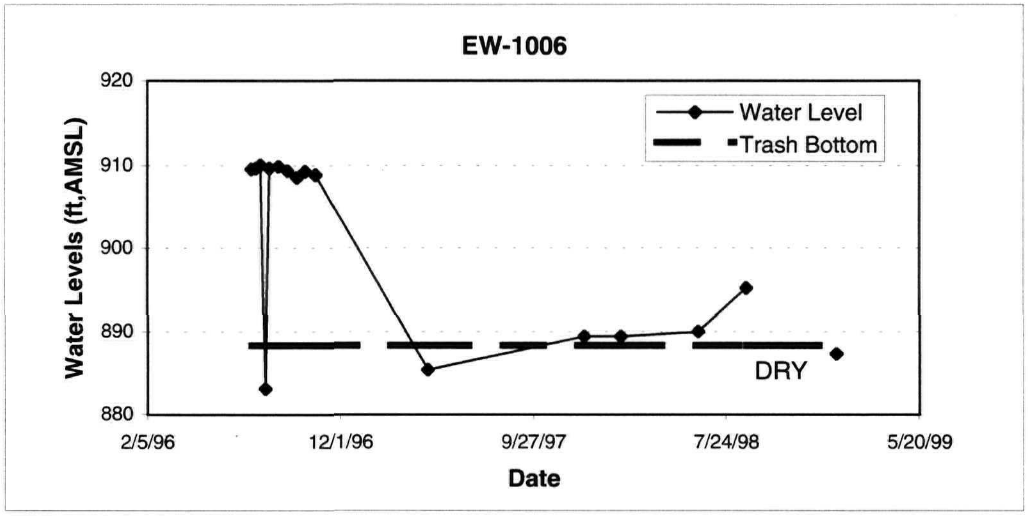


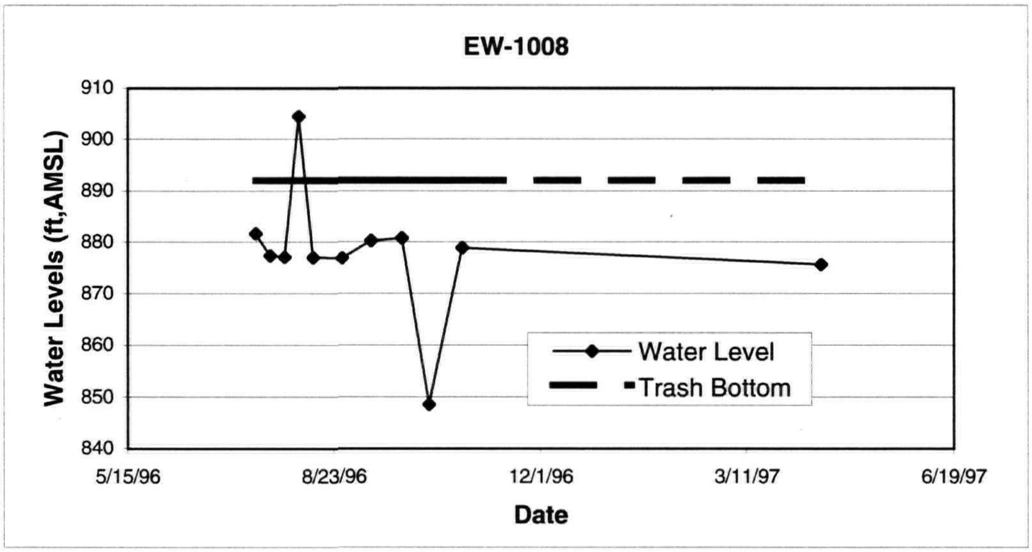


common3/Plamondo/Ltm/Figures/Oct98/O98lfgra.xls/1003-4

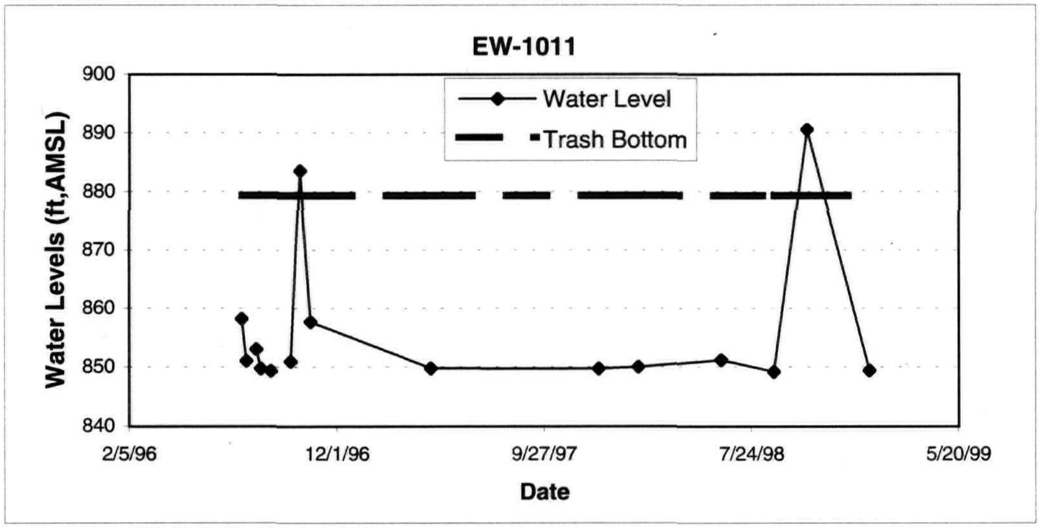
FIGURE 2-20

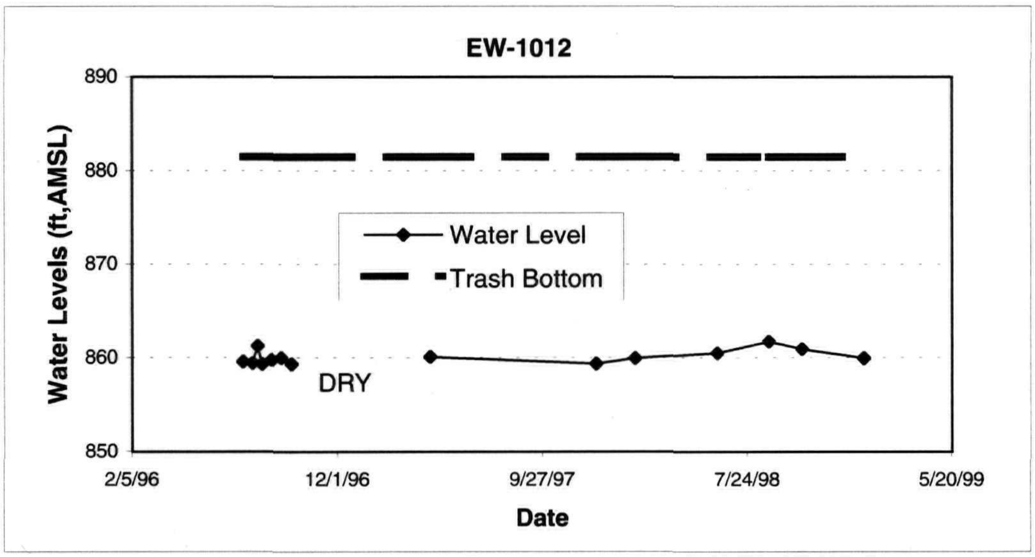
LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1006 and EW-1008
WPAFB - LTM Program



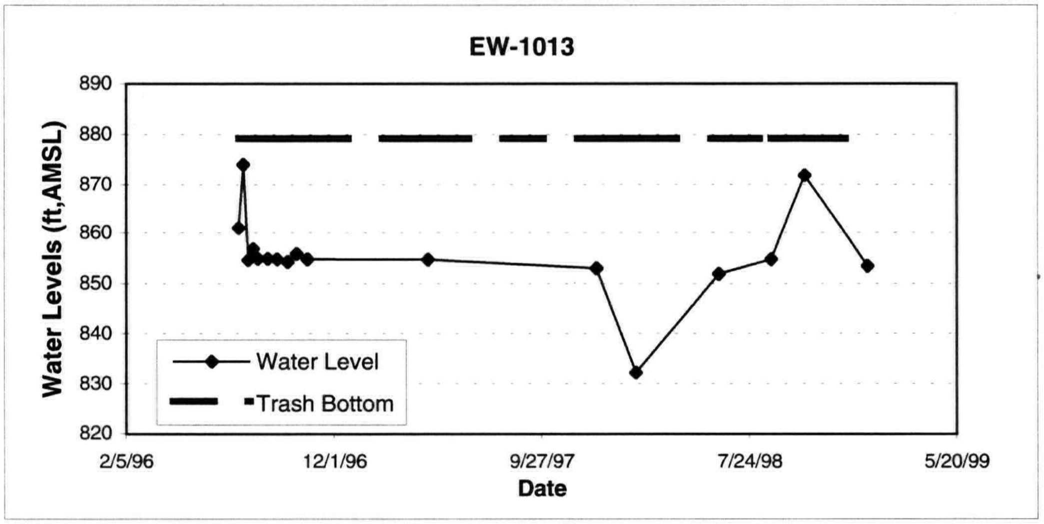


LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1011 and EW-1012
WPAFB - LTM Program





LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1013 and EW-1014
WPAFB - LTM Program



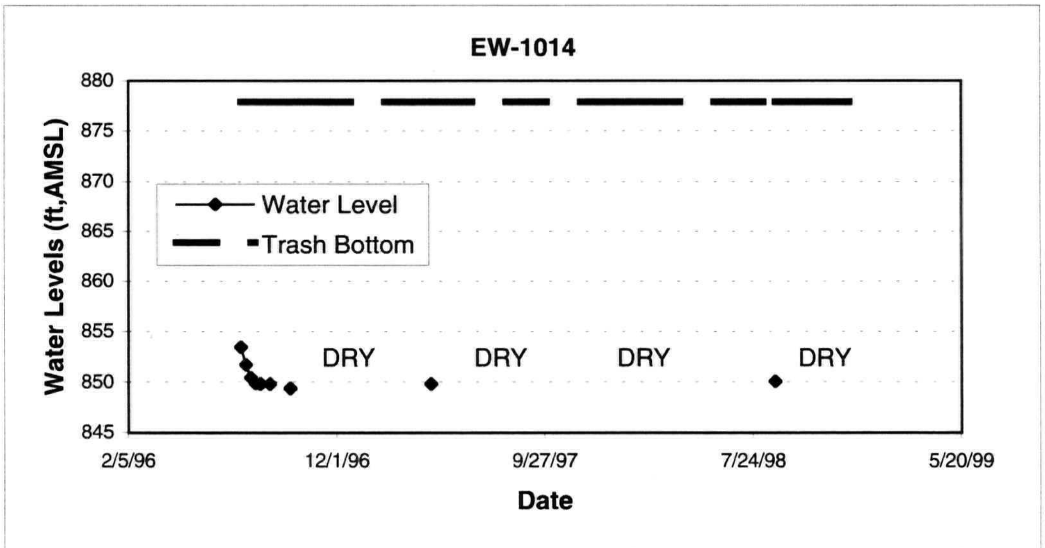
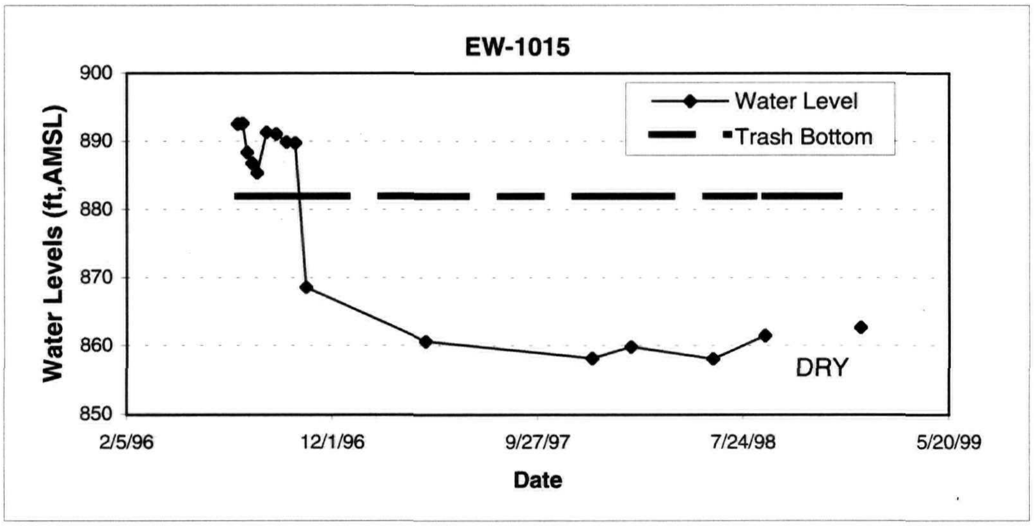


FIGURE 2-23

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1015 and EW-1016
WPAFB - LTM Program



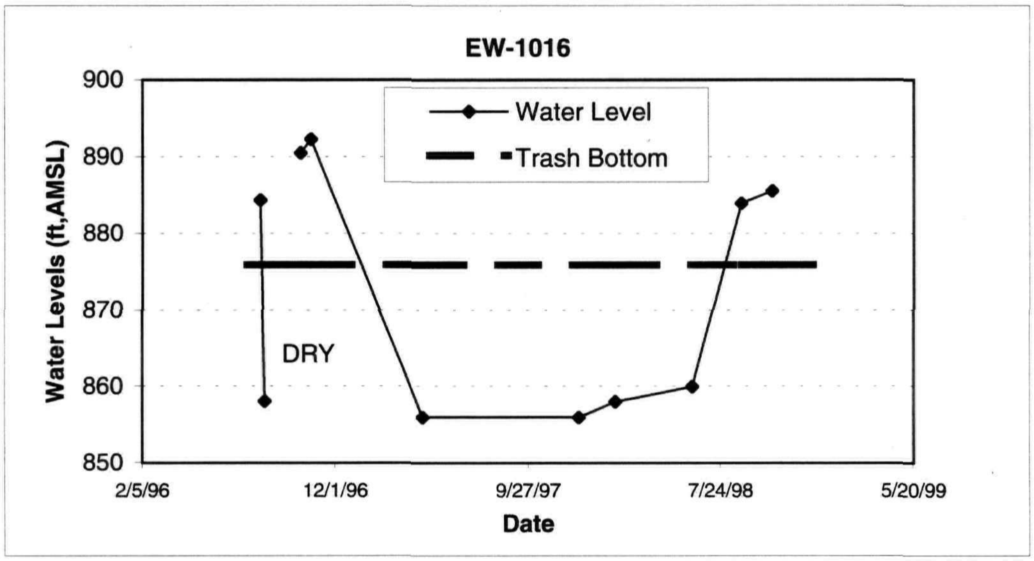


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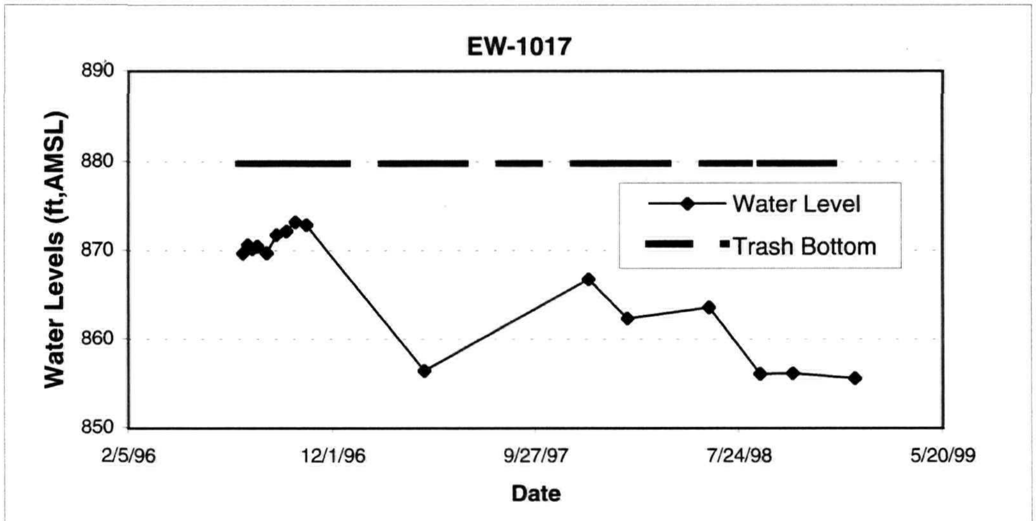
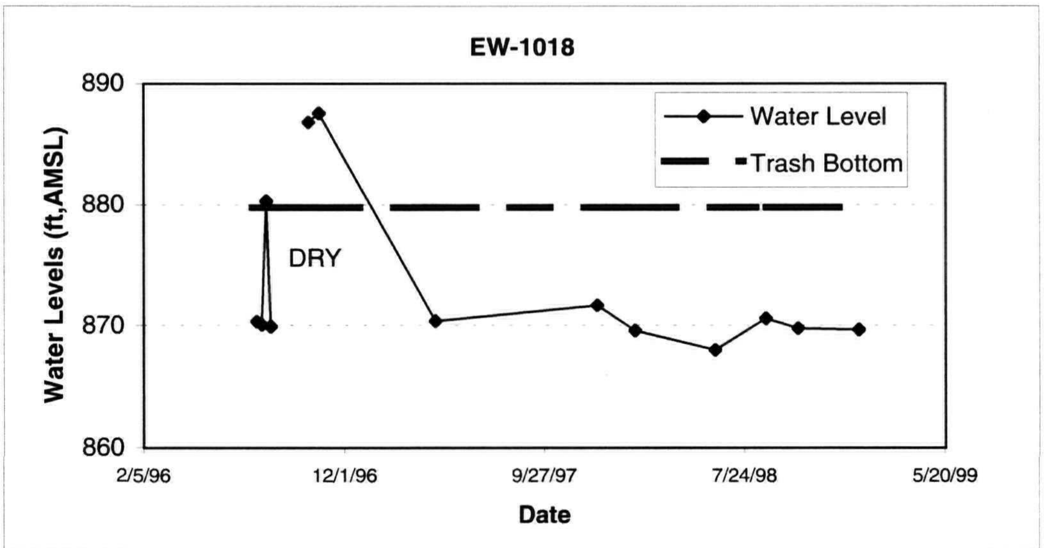
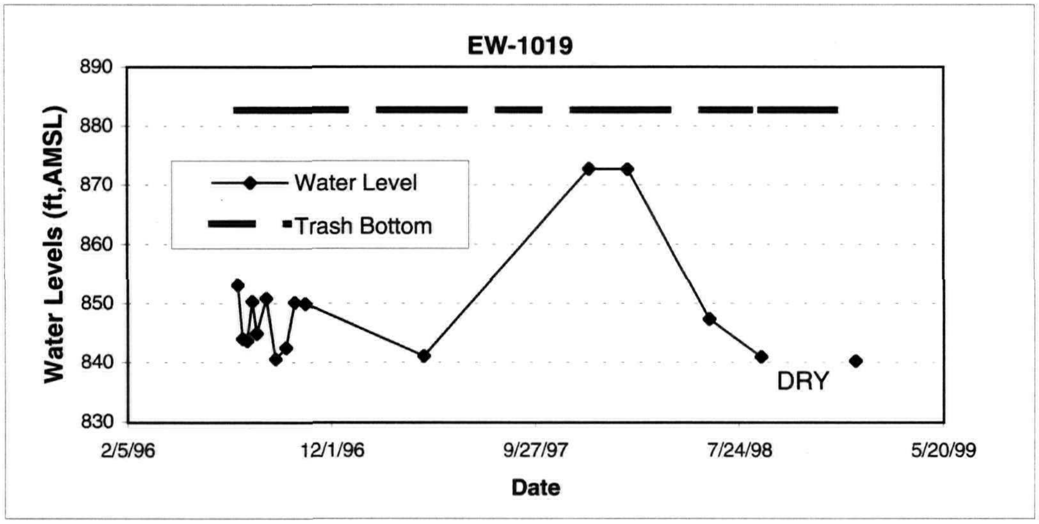
FIGURE 2-24

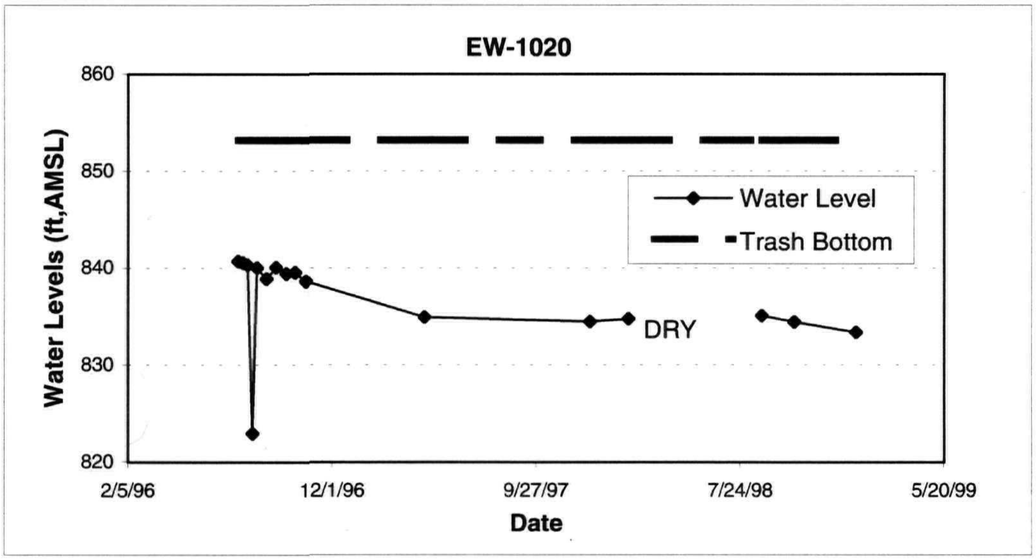
LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1017 and EW-1018
WPAFB - LTM Program





LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1019 and EW-1020
WPAFB - LTM Program

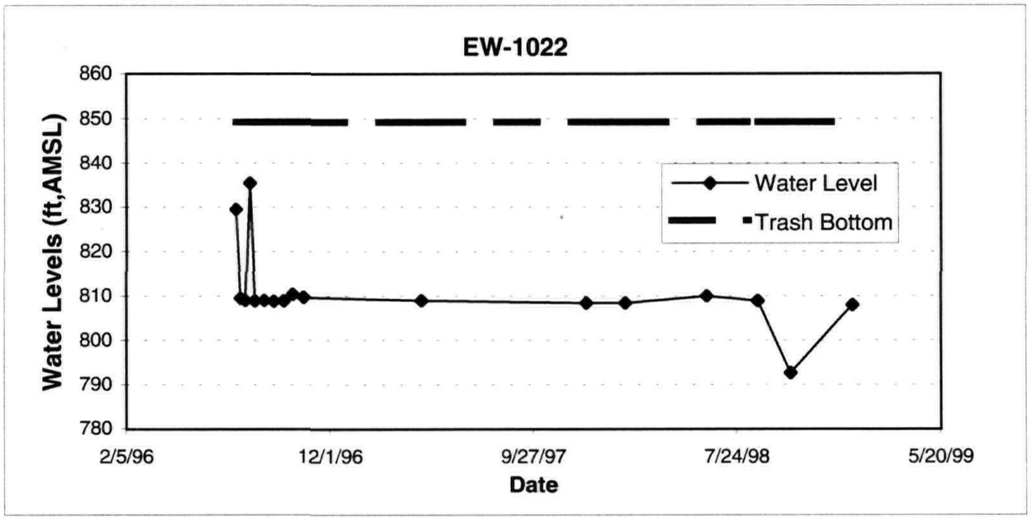




common3/Plamondo/Ltm/Figures/Oct98/O98lfgra.xls/1019-20

FIGURE 2-26

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1022 and EW-1024
WPAFB - LTM Program



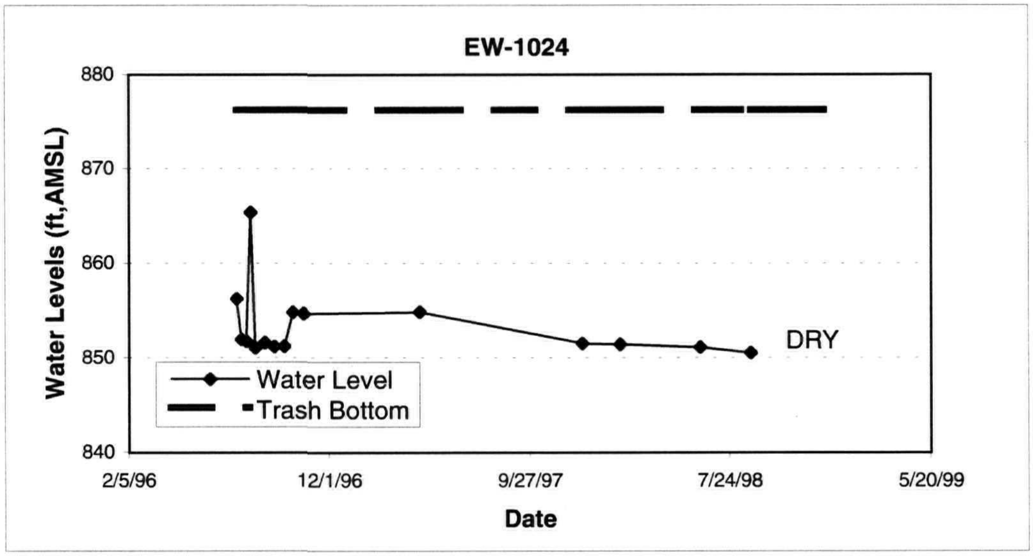


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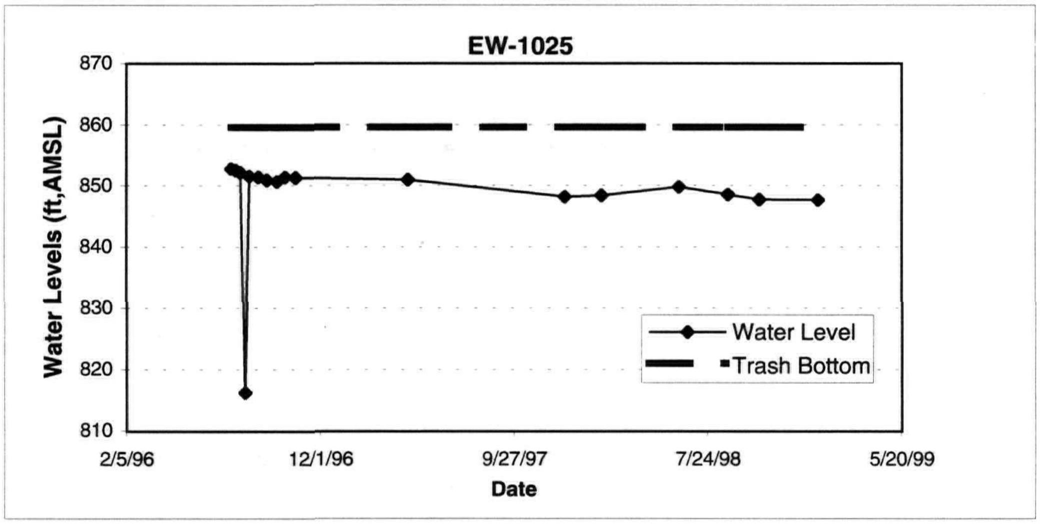
FIGURE 2-27

LANDFILL 10 WATER LEVEL ELEVATION GRAPHS
Extraction Wells: EW-1025 and EW-1026
WPAFB - LTM Program



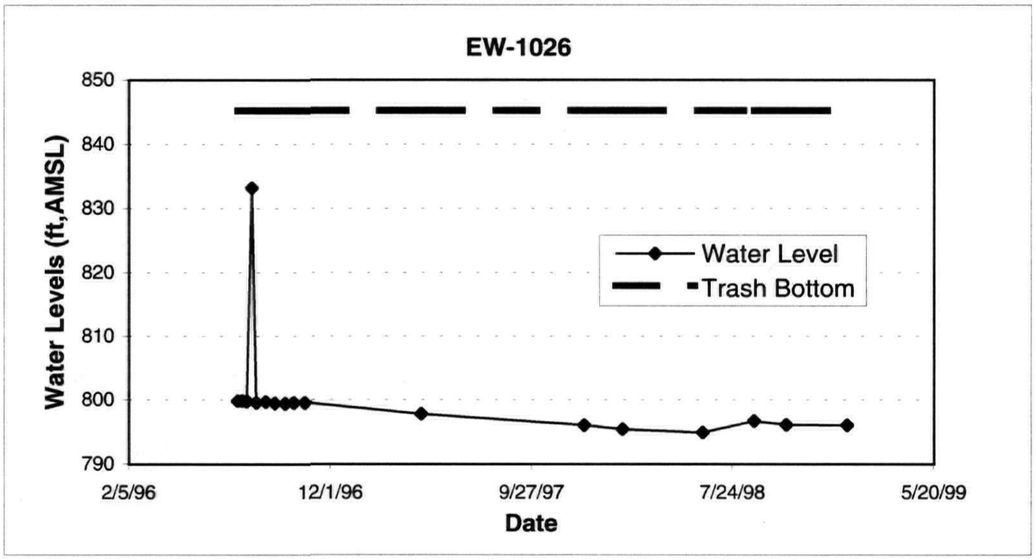


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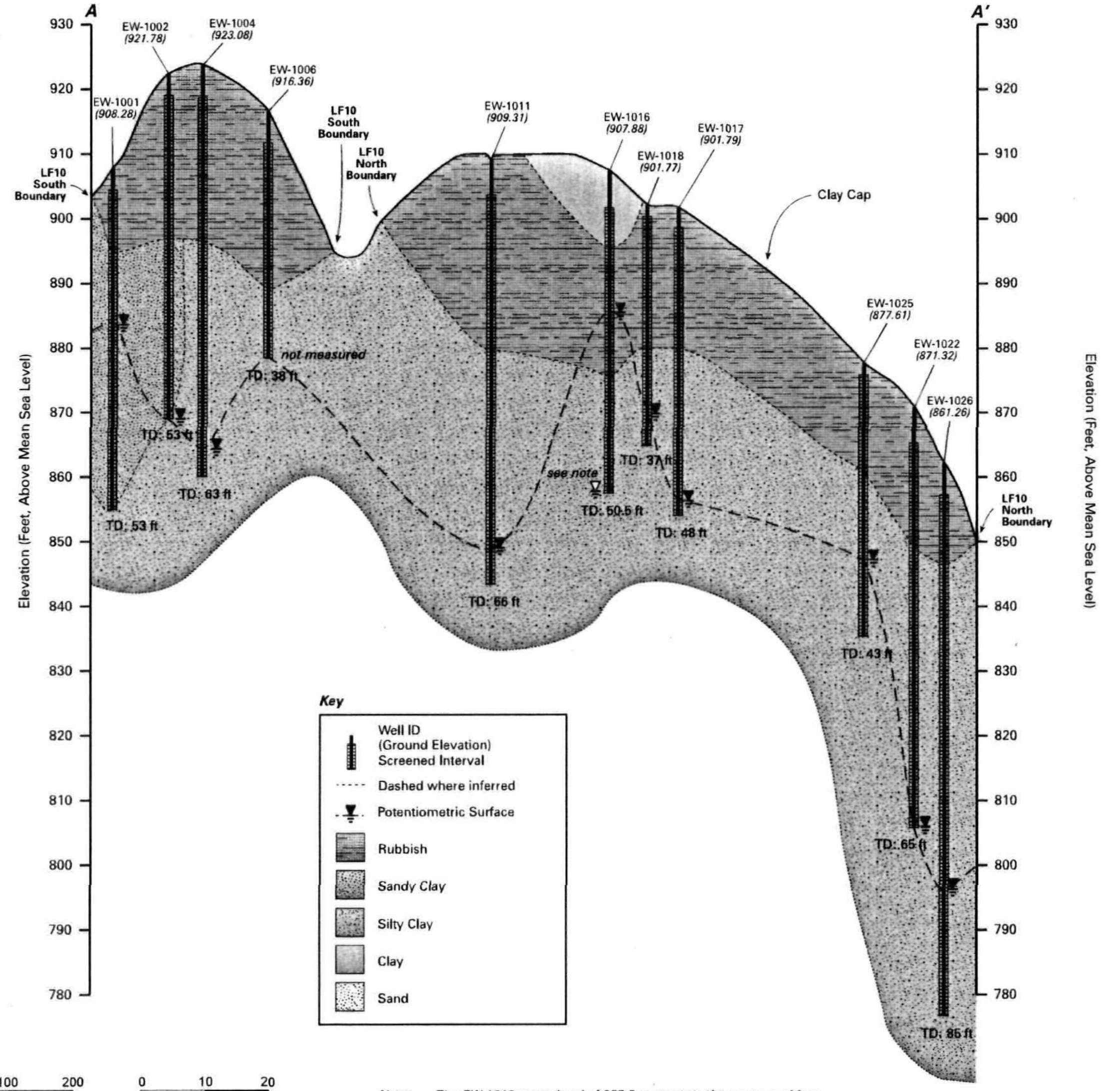
FIGURE 2-28



0 100 200
Horizontal Scale, Feet

0 10 20
Vertical Scale, Feet

Note: The EW-1016 water level of 857.5 represents the average of four consecutive meaurements from April and December 1997, February and June 1998 which was 857.5.

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Figure 2-29.
Landfill 10 Geologic Cross-Section and Potentiometric Surface: October 1998.

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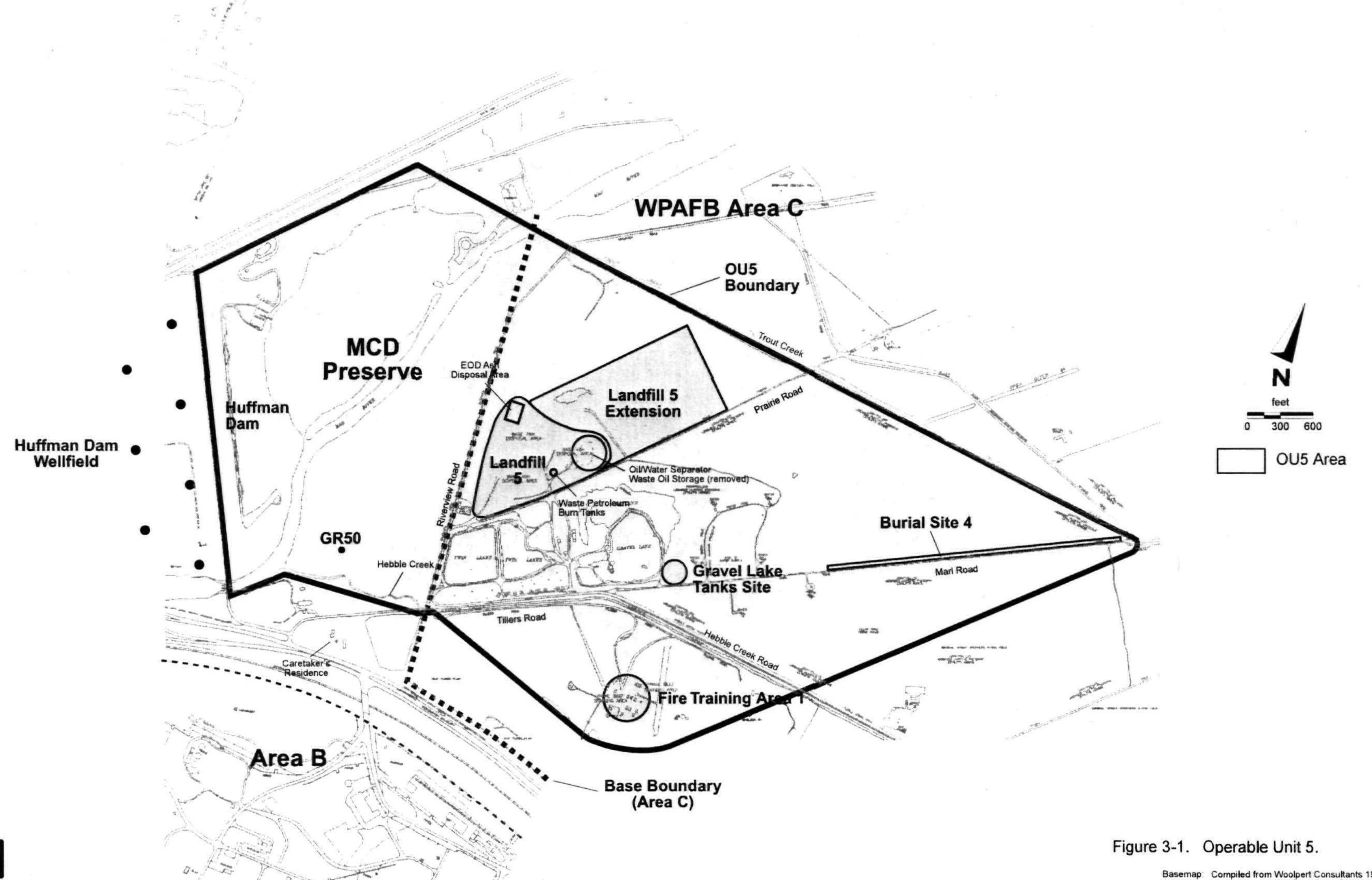

DRAWING BY | JIS III | 4/27/94
CHECKED BY | PCM | 2/1/95
APPROVED BY | SWS | 2/1/95
DRAWING NO. S-322504-6-494-D4

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Figure 3-1. Operable Unit 5.

Basemap: Compiled from Woolpert Consultants 1987
Woolpert Consultants 1991
Henderson Aerial Surveys, Inc. 1993

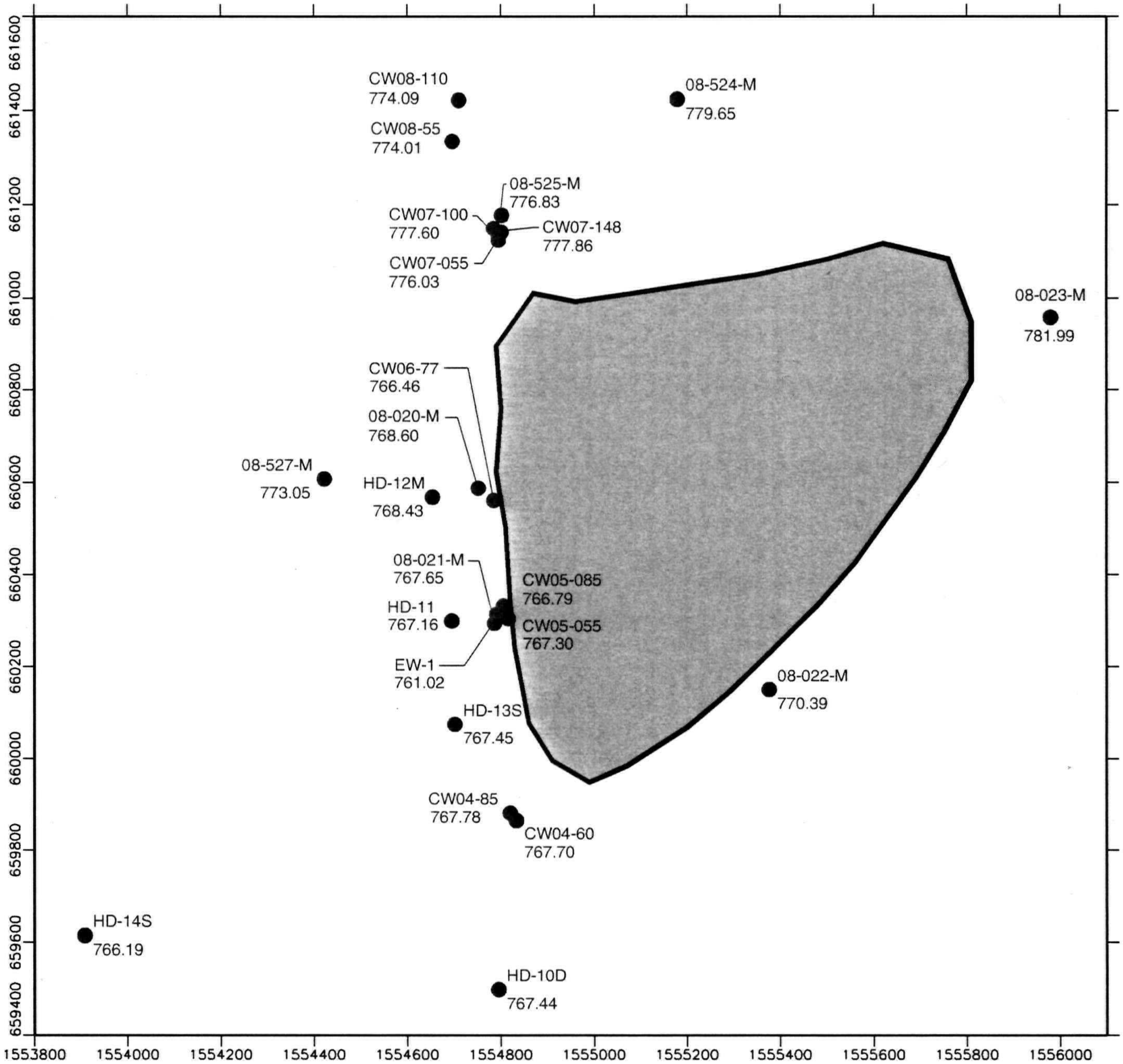

Figure 3-2

OU5
Water Level Elevations:
December 9, 1998

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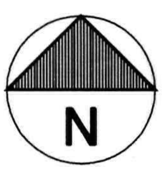
Wright-Patterson Air Force Base
Dayton, Ohio



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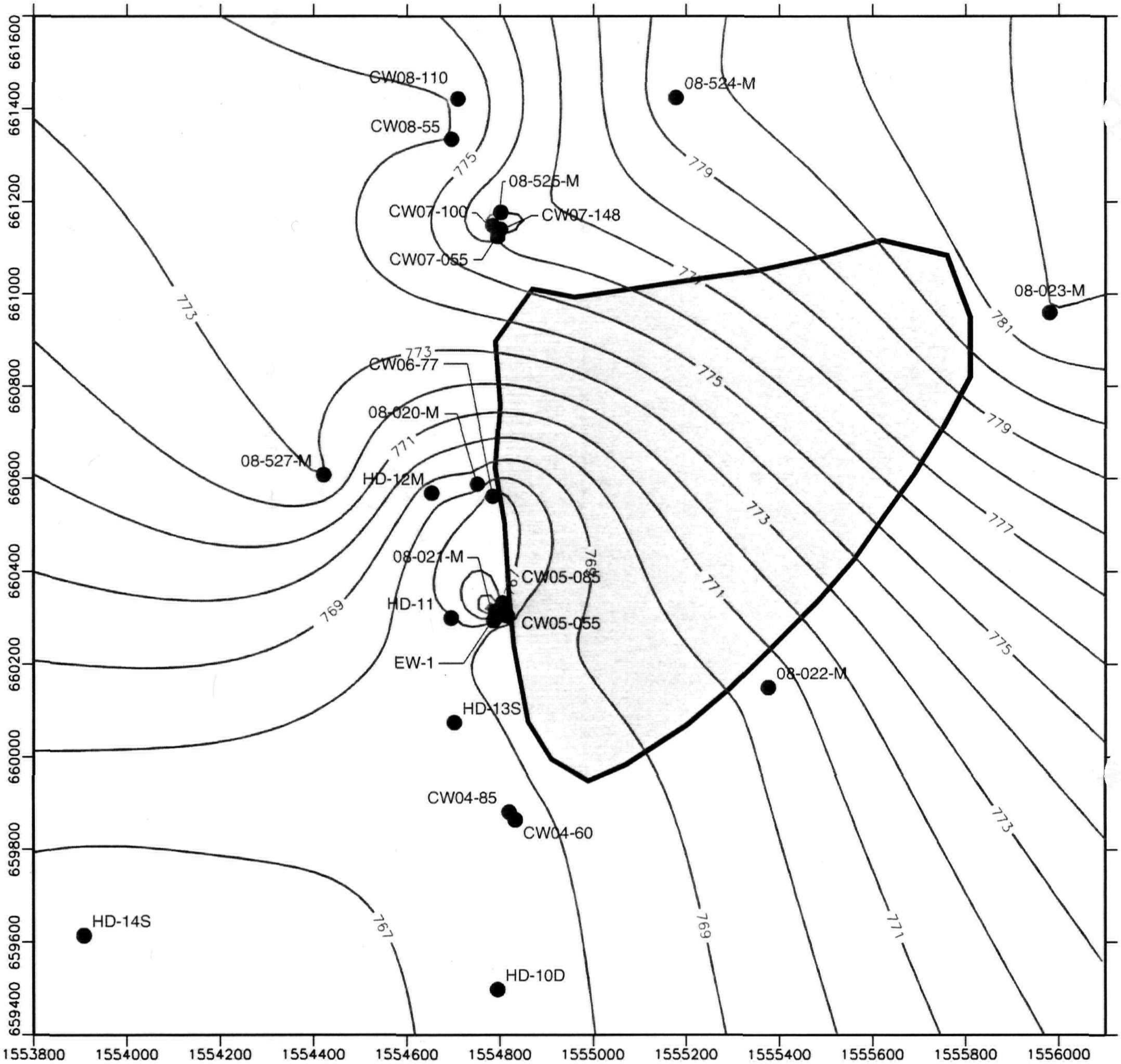

Figure 3-3

OU5
Groundwater Level
Elevation Contour Plot:
December 9, 1998

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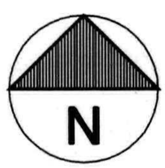

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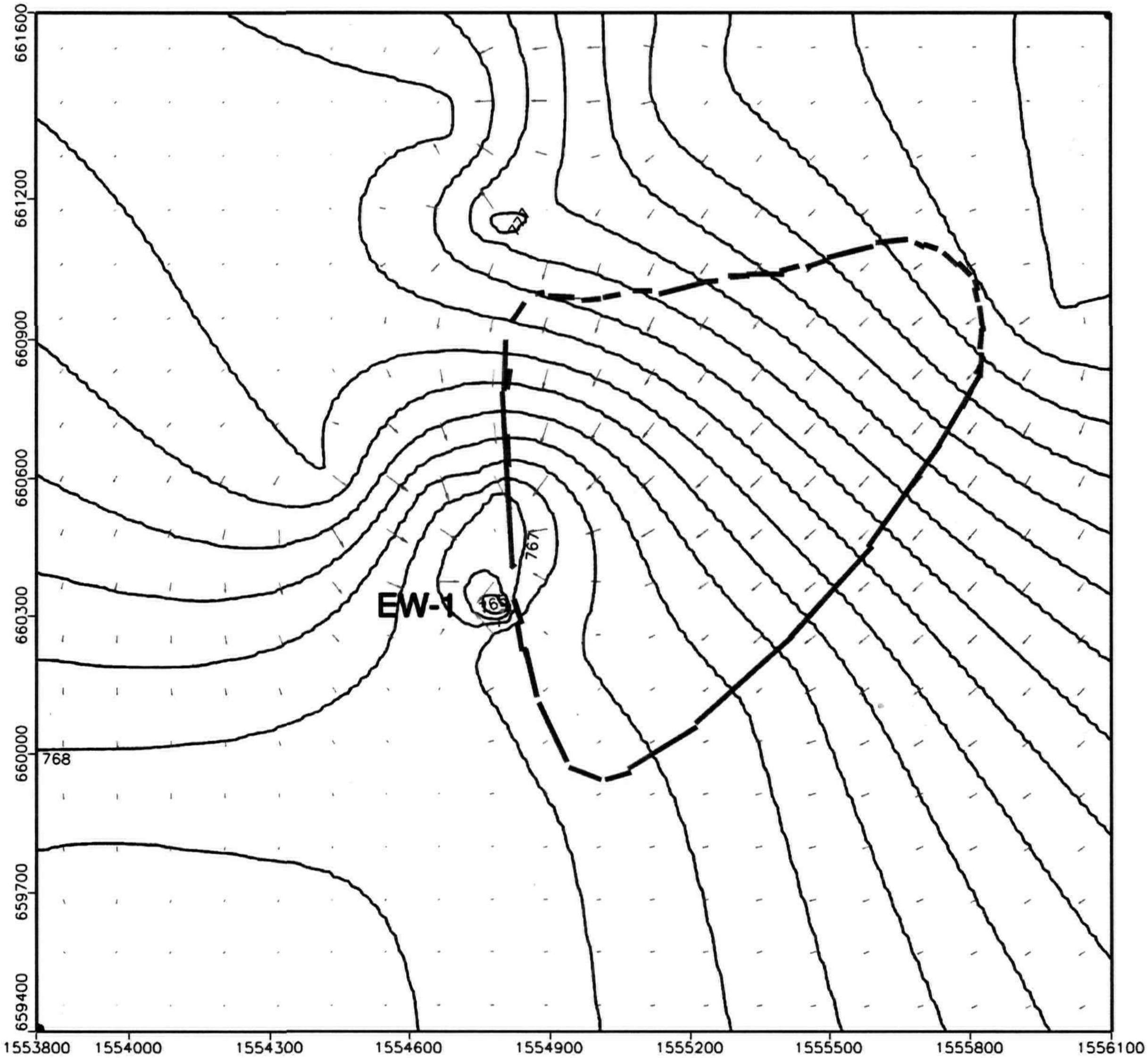

Figure 3-4

OU 5
Groundwater Velocity Vector Plot:
December 9, 1998

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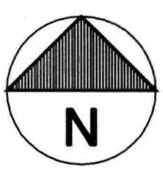

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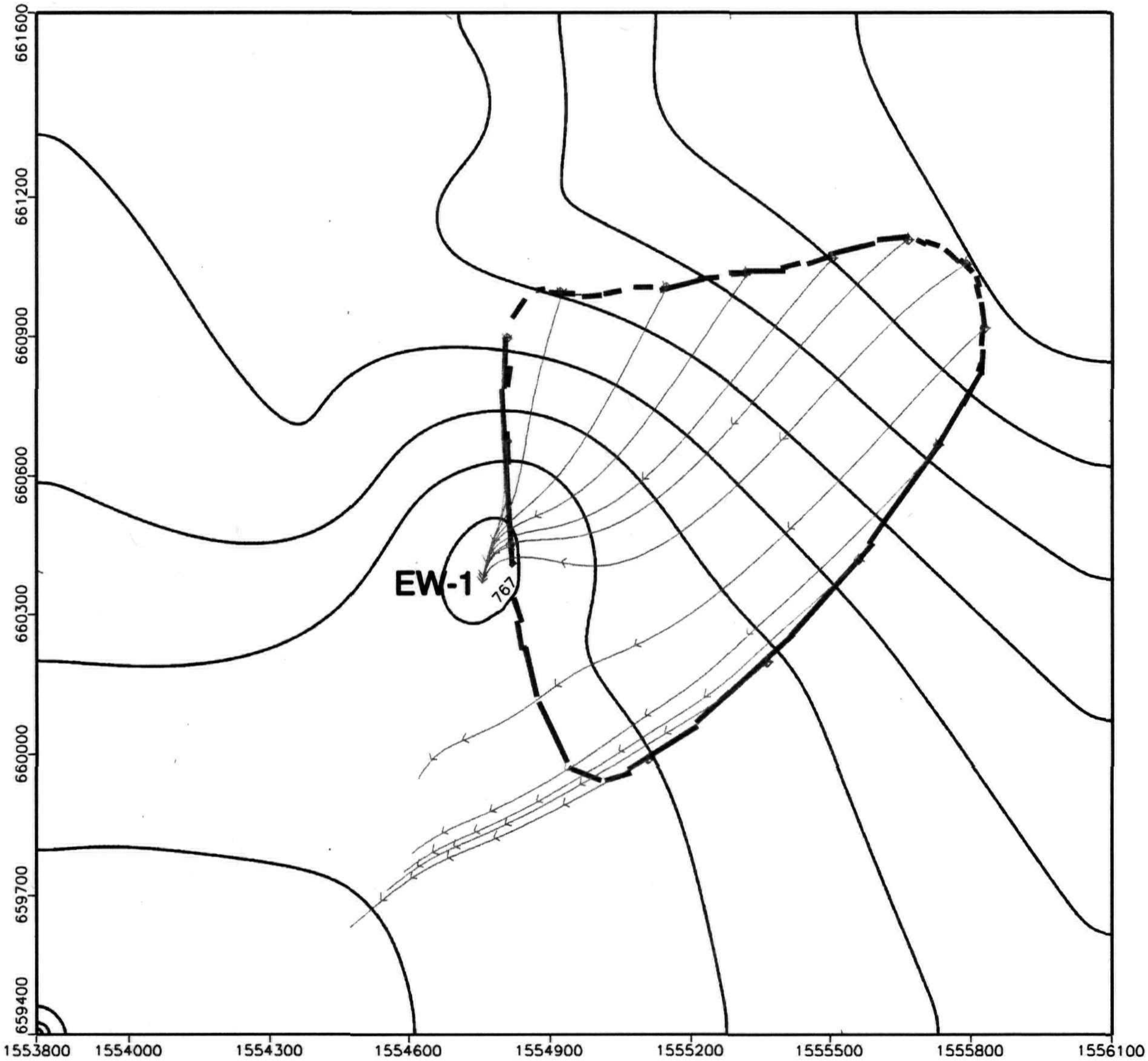

Figure 3-5

OU 5
Particle Tracking Plot:
December 9, 1998

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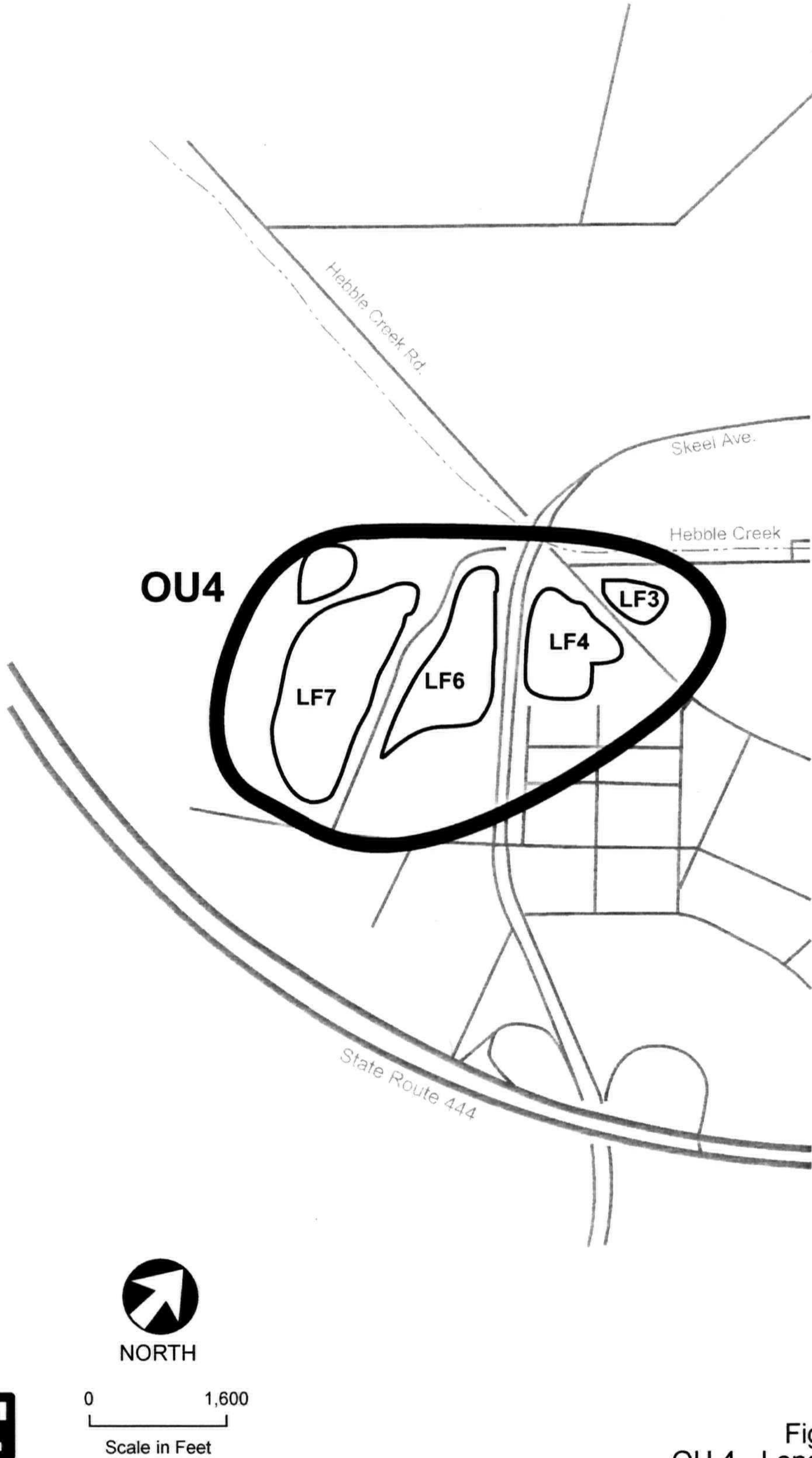

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Figure 4-1.
OU 4 - Landfills 3, 4, 6 and 7.

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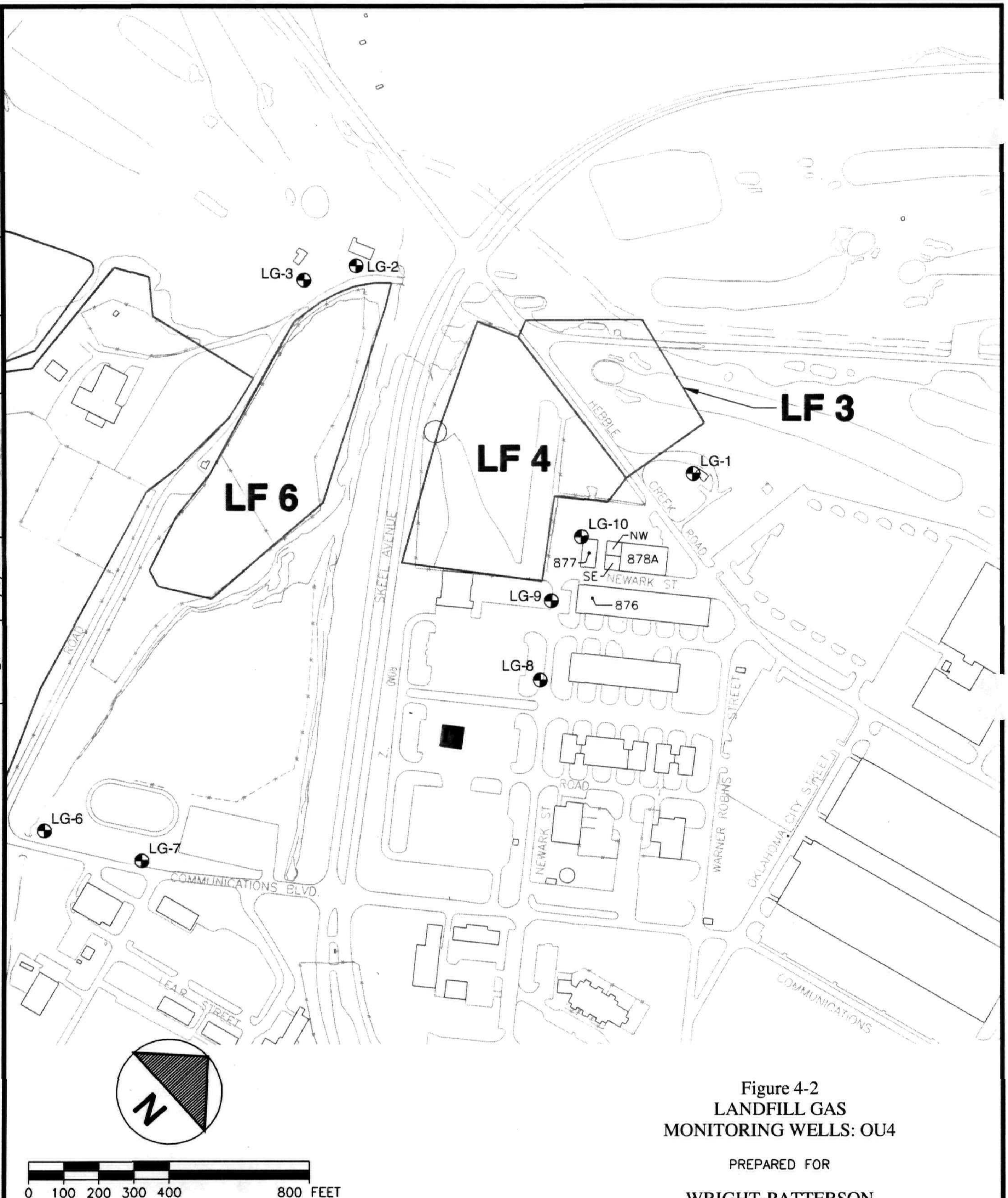

Figure 4-2
LANDFILL GAS
MONITORING WELLS: OU4

PREPARED FOR

WRIGHT-PATTERSON
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IT INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND

LG-1 LANDFILL GAS MONITORING WELL LOCATIONS

IRP SITES (LOCATIONS APPROXIMATE)

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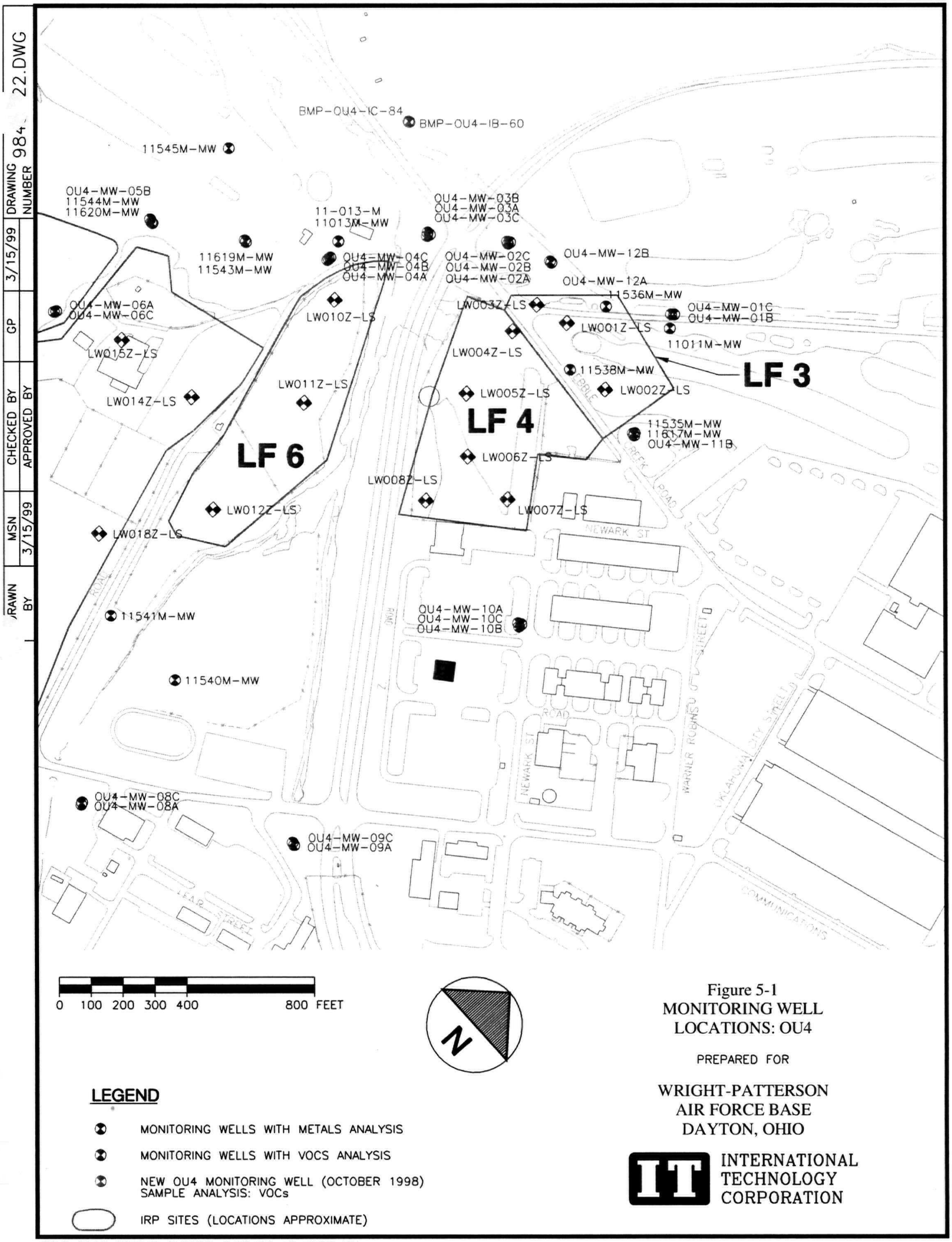

Figure 5-1
MONITORING WELL
LOCATIONS: OU4

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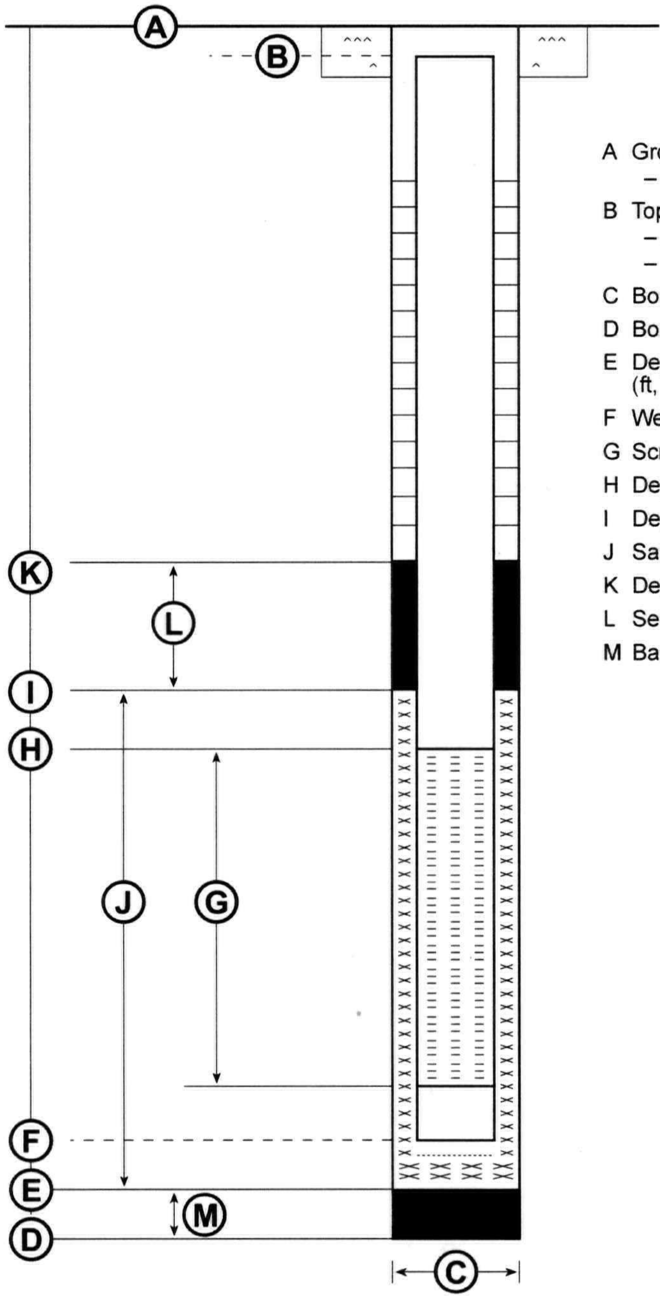

A Ground surface (GS)
  – elevation (ft, MSL)

B Top of casing
  – elevation (ft, MSL)
  – height (ft, BGS)

C Borehole diameter (ft)

D Borehole depth (ft, BGS)

E Depth to bottom of sand pack (ft, BGS)

F Well depth (ft, BGS)

G Screen length (ft)

H Depth to screen (ft, BGS)

I Depth to sand pack (ft, BGS)

J Sand pack thickness (ft)

K Depth to seal (ft, BGS)

L Seal thickness (ft)

M Backfill thickness (ft)

Figure 5-2. Typical Flush-Mounted Well Construction Diagram.

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APPROVED BY 6/2/94

DRAWING BY

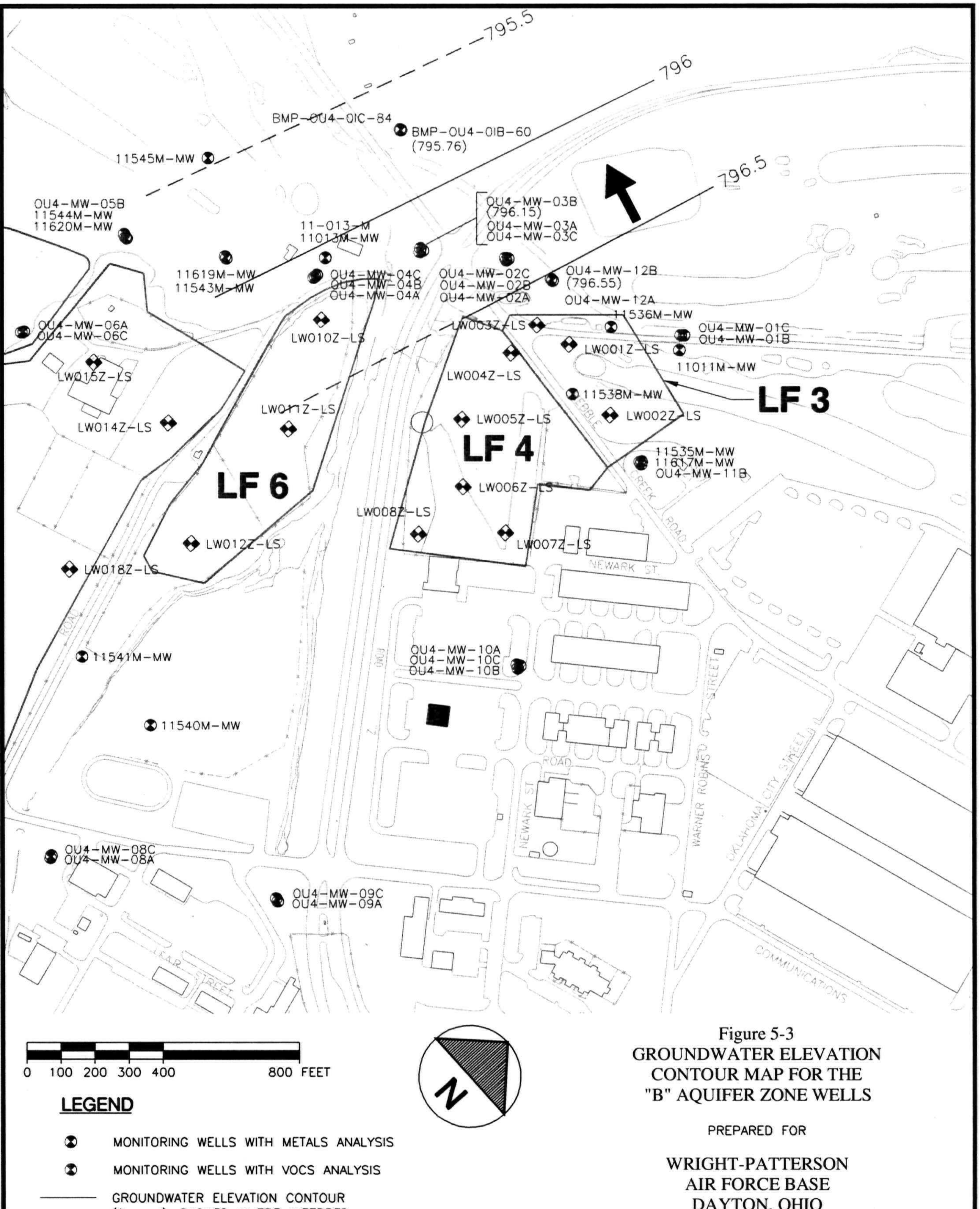

Figure 5-3
GROUNDWATER ELEVATION CONTOUR MAP FOR THE "B" AQUIFER ZONE WELLS

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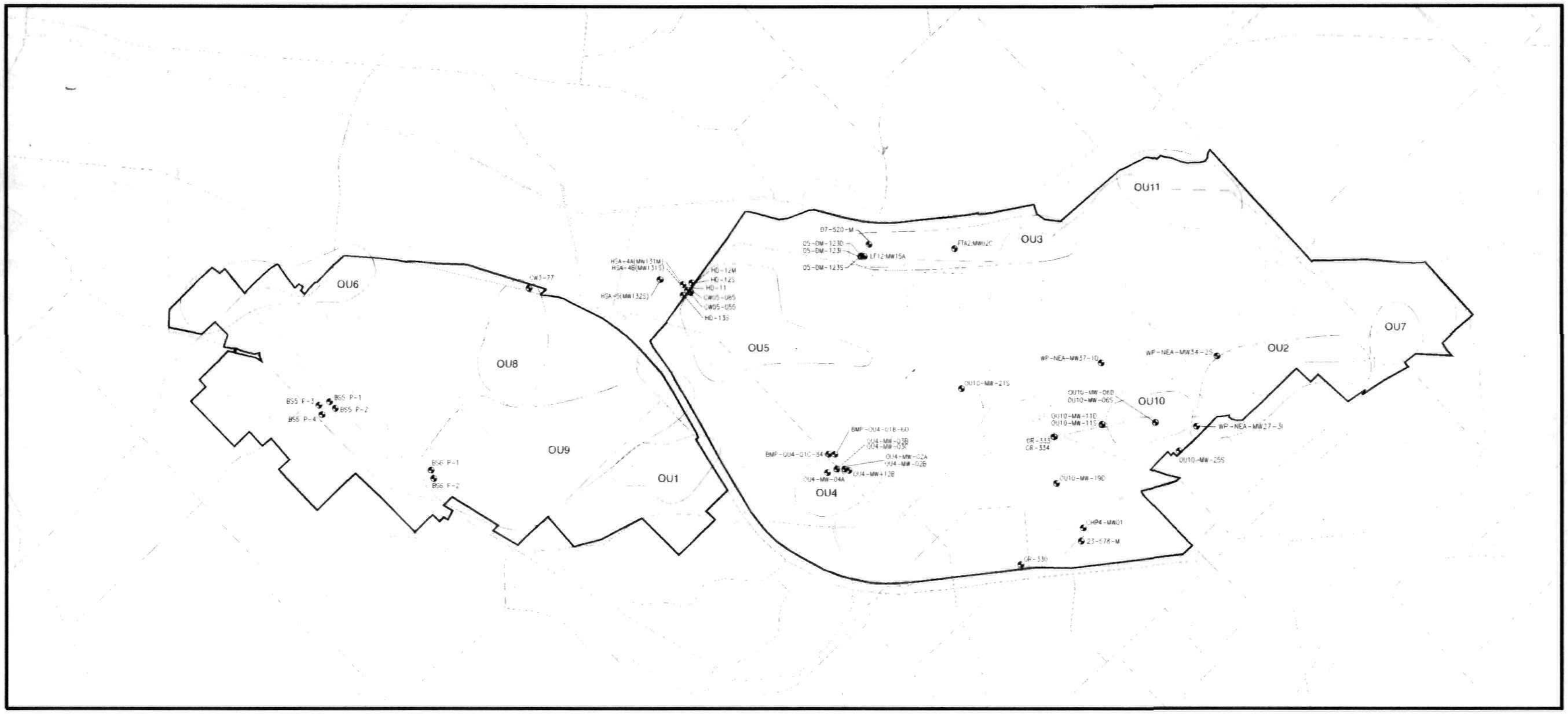

LEGEND:

- Monitoring Well Locations
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries

Figure 6-1
Semiannual Basewide Long-Term Monitoring Well Locations

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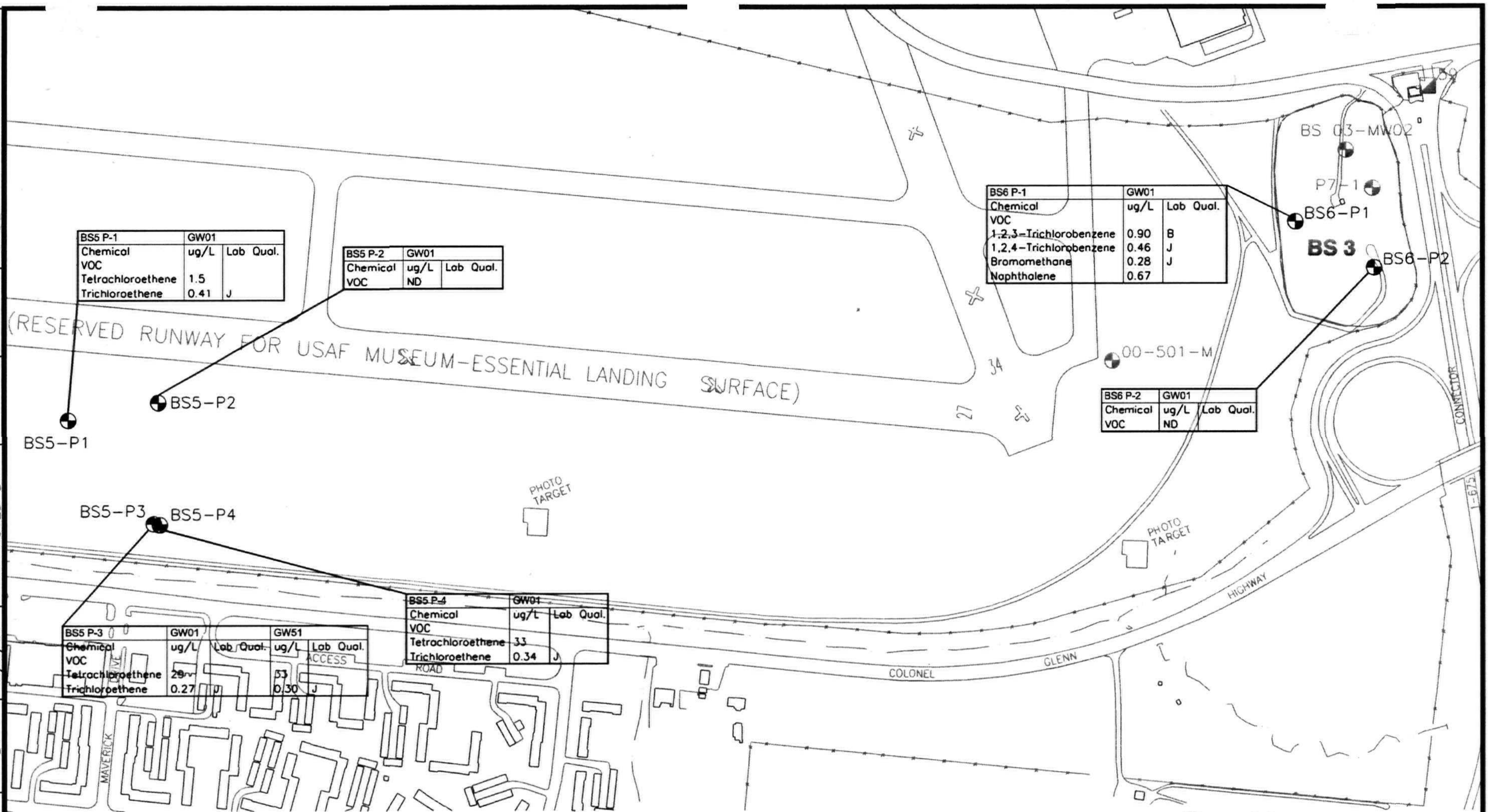

BS5 P-1	GW01	
Chemical	ug/L	Lab Qual.
VOC		
Tetrachloroethene	1.5	
Trichloroethene	0.41	J

BS5 P-2	GW01	
Chemical	ug/L	Lab Qual.
VOC	ND	

BS5 P-3	GW01		GW51	
Chemical	ug/L	Lab Qual.	ug/L	Lab Qual.
VOC				
Tetrachloroethene	29		33	
Trichloroethene	0.27	J	0.30	J

BS5 P-4	GW01	
Chemical	ug/L	Lab Qual.
VOC		
Tetrachloroethene	33	
Trichloroethene	0.34	J

BS6 P-1	GW01	
Chemical	ug/L	Lab Qual.
VOC		
1,2,3-Trichlorobenzene	0.90	B
1,2,4-Trichlorobenzene	0.46	J
Bromomethane	0.28	J
Naphthalene	0.67	

BS6 P-2	GW01	
Chemical	ug/L	Lab Qual.
VOC	ND	

LEGEND:

MONITORING WELL LOCATION

N

0 100 200 300 400 500 1000 FEET

Figure 6-2
Burial Site 5 and 6
Detected Chemicals of Concern:
October 1998

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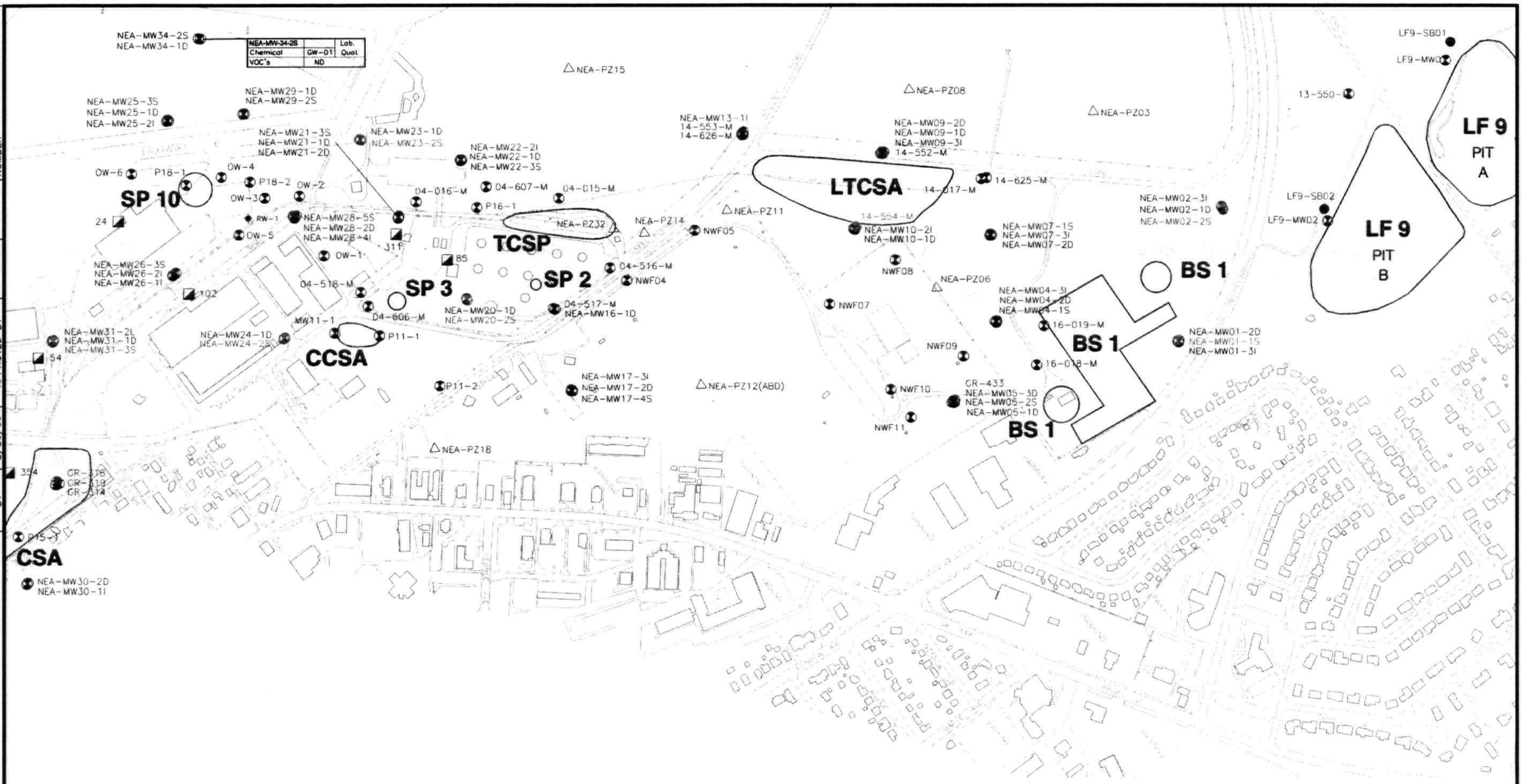

LEGEND

MONITORING WELL LOCATION

IRP SITES (LOCATIONS APPROXIMATE)

N

0 100 200 300 400 500 1000 FEET

Figure 6-3
OU2 Detected Chemicals of Concern: October 1998

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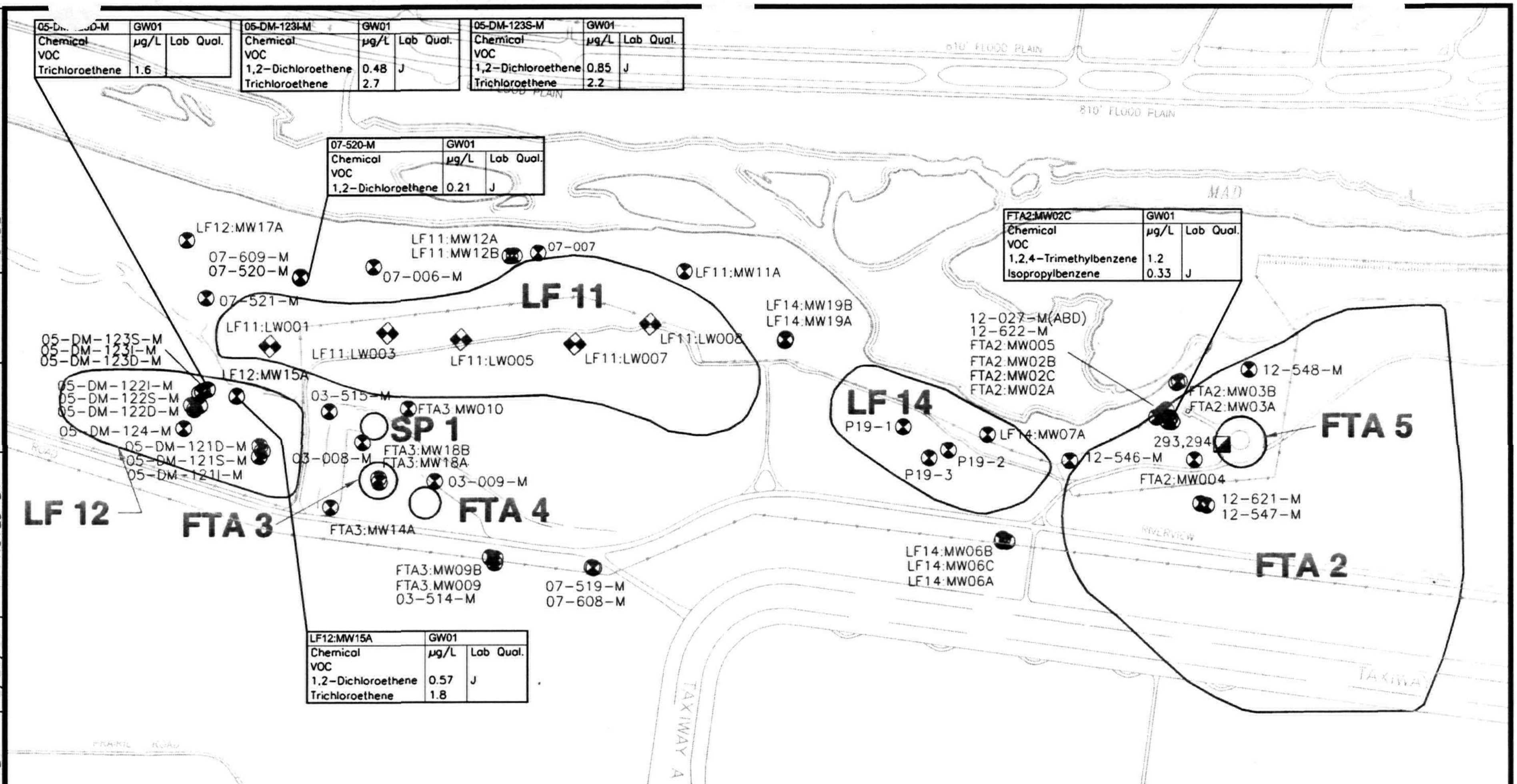

05-D[illegible]D-M	GW01	
Chemical	µg/L	Lab Qual.
VOC		
Trichloroethene	1.6	

05-DM-123I-M	GW01	
Chemical	µg/L	Lab Qual.
VOC		
1,2-Dichloroethene	0.48	J
Trichloroethene	2.7	

05-DM-123S-M	GW01	
Chemical	µg/L	Lab Qual.
VOC		
1,2-Dichloroethene	0.85	J
Trichloroethene	2.2	

07-520-M	GW01	
Chemical	µg/L	Lab Qual.
VOC		
1,2-Dichloroethene	0.21	J

FTA2:MW02C	GW01	
Chemical	µg/L	Lab Qual.
VOC		
1,2,4-Trimethylbenzene	1.2	
Isopropylbenzene	0.33	J

LF12:MW15A	GW01	
Chemical	µg/L	Lab Qual.
VOC		
1,2-Dichloroethene	0.57	J
Trichloroethene	1.8	

LEGEND

MONITORING WELL LOCATION

ND NOT DETECTED

IRP SITES (LOCATIONS APPROXIMATE)

N

0 100 200 300 400 500 1000 FEET

Figure 6-4
OU3 Detected Chemicals of Concern: October 1998

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MSN	2/26/99
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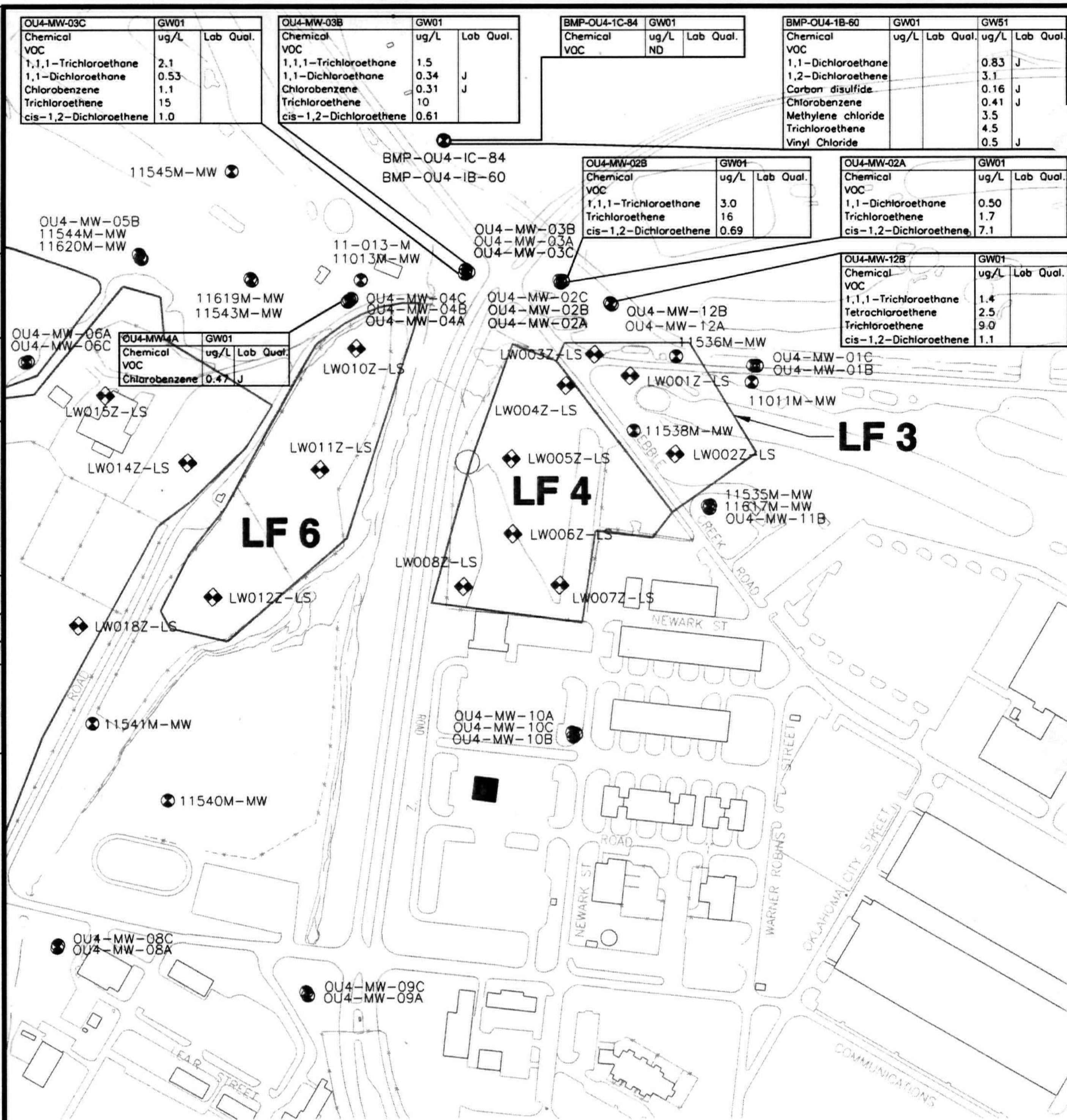

0 100 200 300 400 800 FEET

N

Figure 6-5
OU4 Detected Chemicals of Concern: October 1998

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Dayton, Ohio

LEGEND

- MONITORING WELL LOCATION
- ND NOT DETECTED
- 15 VOC CONCENTRATION (ug/l) (RED = >MCL)
- IRP SITES (LOCATIONS APPROXIMATE)

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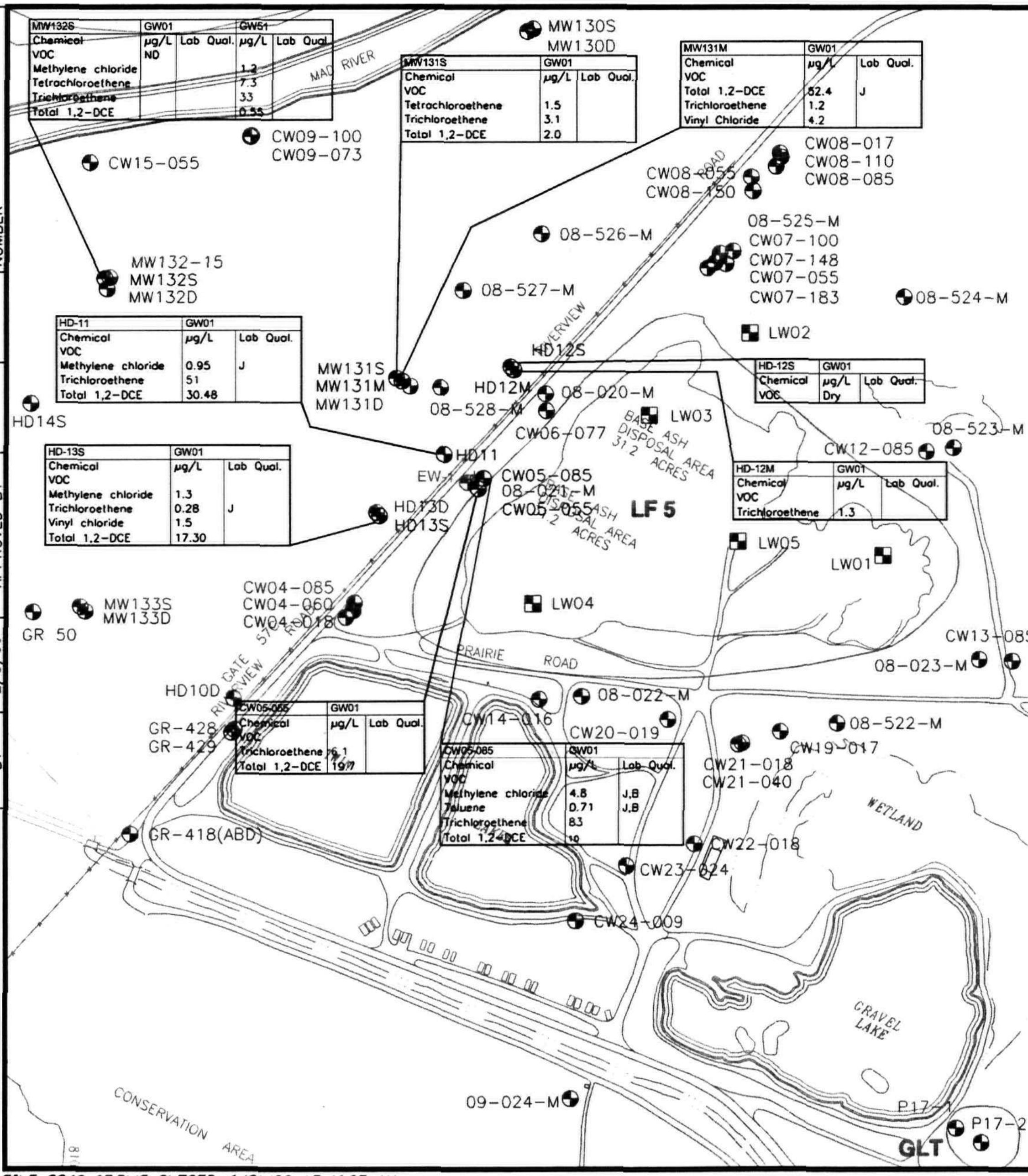
FILE 9843-11.DWG CLOSED: 3/31/99 AT 2:41 PM



MW132S	GW01		GW51	
Chemical	µg/L	Lab Qual.	µg/L	Lab Qual.
VOC	ND			
Methylene chloride			1.2	
Tetrachloroethene			7.3	
Trichloroethene			33	
Total 1,2-DCE			0.55	

MW131S	GW01	
Chemical	µg/L	Lab Qual.
VOC		
Tetrachloroethene	1.5	
Trichloroethene	3.1	
Total 1,2-DCE	2.0	

MW131M	GW01	
Chemical	µg/L	Lab Qual.
VOC		
Total 1,2-DCE	52.4	J
Trichloroethene	1.2	
Vinyl Chloride	4.2	

HD-11	GW01	
Chemical	µg/L	Lab Qual.
VOC		
Methylene chloride	0.95	J
Trichloroethene	51	
Total 1,2-DCE	30.48	

HD-12S	GW01	
Chemical	µg/L	Lab Qual.
VOC	Dry	

HD-13S	GW01	
Chemical	µg/L	Lab Qual.
VOC		
Methylene chloride	1.3	
Trichloroethene	0.28	J
Vinyl chloride	1.5	
Total 1,2-DCE	17.30	

HD-12M	GW01	
Chemical	µg/L	Lab Qual.
VOC		
Trichloroethene	1.3	

CW05-055	GW01	
Chemical	µg/L	Lab Qual.
VOC		
Trichloroethene	6.1	
Total 1,2-DCE	19.7	

CW05-085	GW01	
Chemical	µg/L	Lab Qual.
VOC		
Methylene chloride	4.8	J,B
Toluene	0.71	J,B
Trichloroethene	83	
Total 1,2-DCE	10	

LEGEND:

MONITORING WELL LOCATION

N

0 100 200 300 400 800 FEET

Figure 6-6
OU5 Detected Chemicals of Concern: October 1998

PREPARED FOR

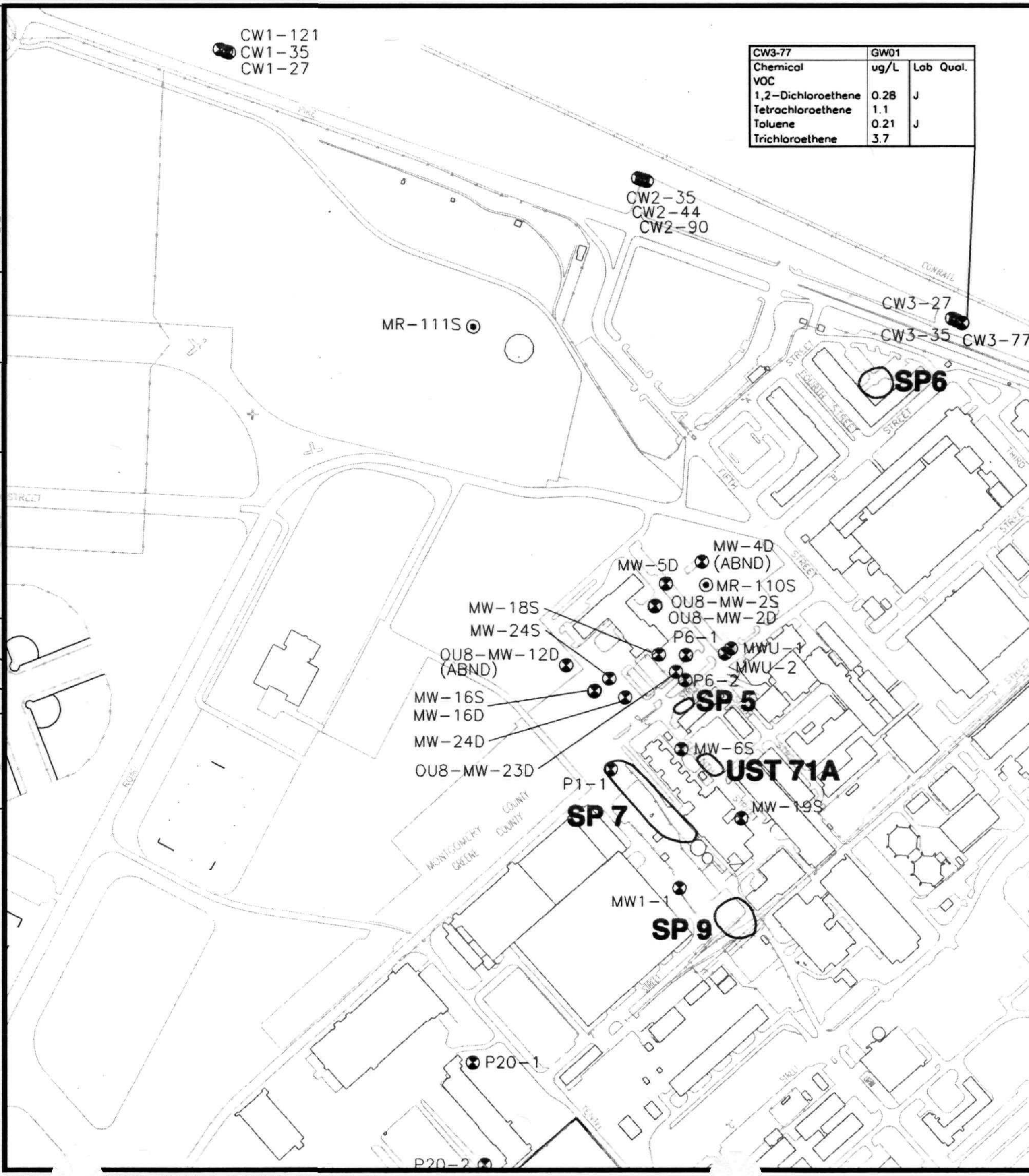
Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

DRAWN BY	MSN	CHECKED BY	APPROVED BY	GP	DRAWING NUMBER
	2/3/99			6/21/99	9843-07.DWG

FILE 9843-07.DWG CLOSED: 6/21/99 AT 10:27 AM

DRAWN BY	MSN 2/26/99	CHECKED BY / APPROVED BY	GP	3/8/99	DRAWING NUMBER 9843-12.DWG



CW3-77	GW01	
Chemical	ug/L	Lab Qual.
VOC		
1,2-Dichloroethene	0.28	J
Tetrachloroethene	1.1	
Toluene	0.21	J
Trichloroethene	3.7	

LEGEND

MONITORING WELL LOCATION

IRP SITES (LOCATIONS APPROXIMATE)

N

0 200 400 600 1200 FEET

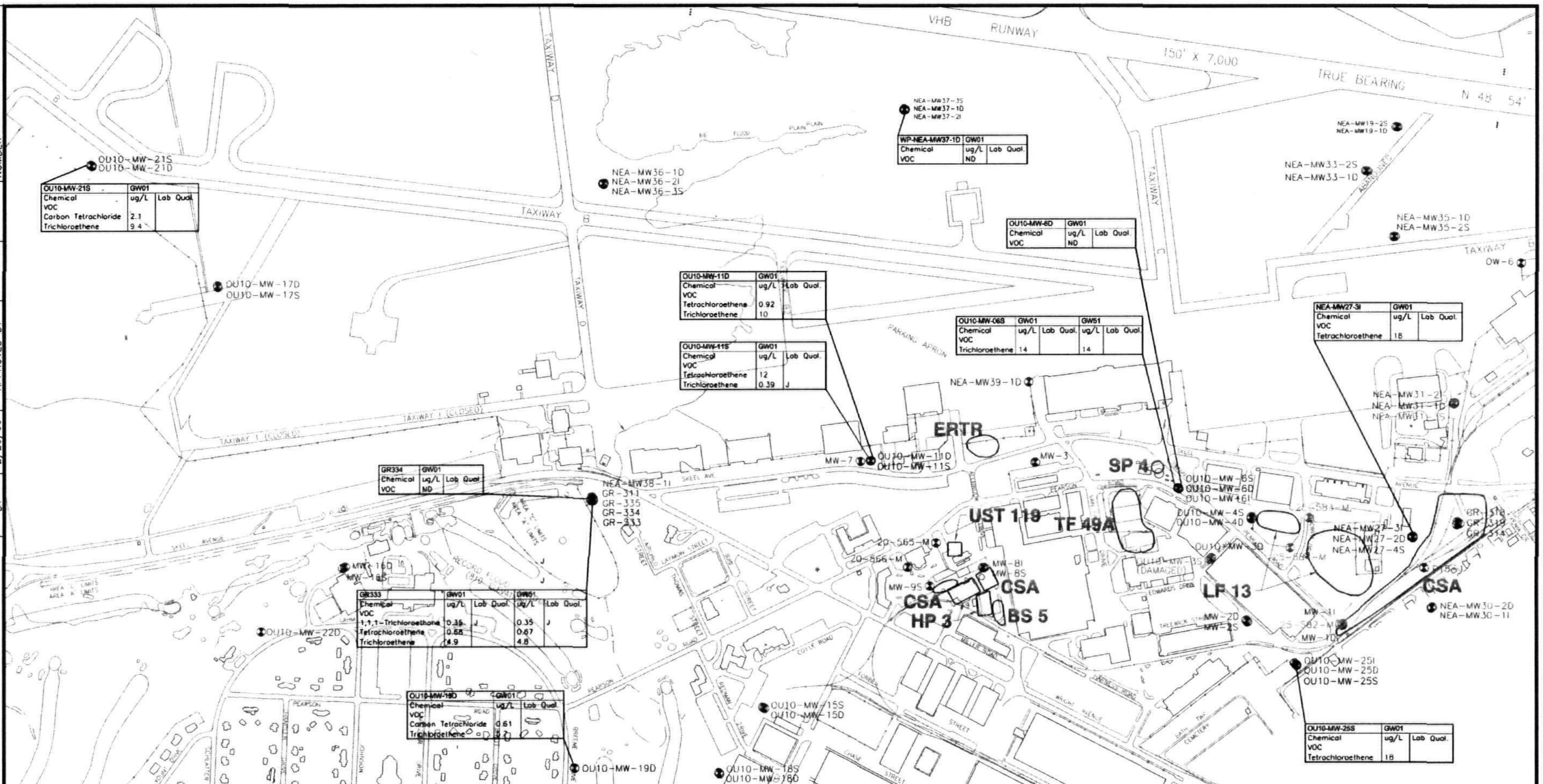
Figure 6-7
OU8 Detected Chemicals of Concern: October 1998

PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

FILE 2.DWG CLOSED: 3/7/99 AT 7:56 PM



DRAWING NUMBER 9843-13.DWG | 3/8/99 | GP | CHECKED BY | APPROVED BY | MSN 2/26/99 | DRAWN BY

LEGEND

- MONITORING WELL LOCATION
- 9.4 VOC CONCENTRATION (RED=>MCL)
- IRP SITES (LOCATIONS APPROXIMATE)

N

0 200 400 600 1200 FEET

Figure 6-8
OU 10 Detected Chemicals of Concern: October 1998

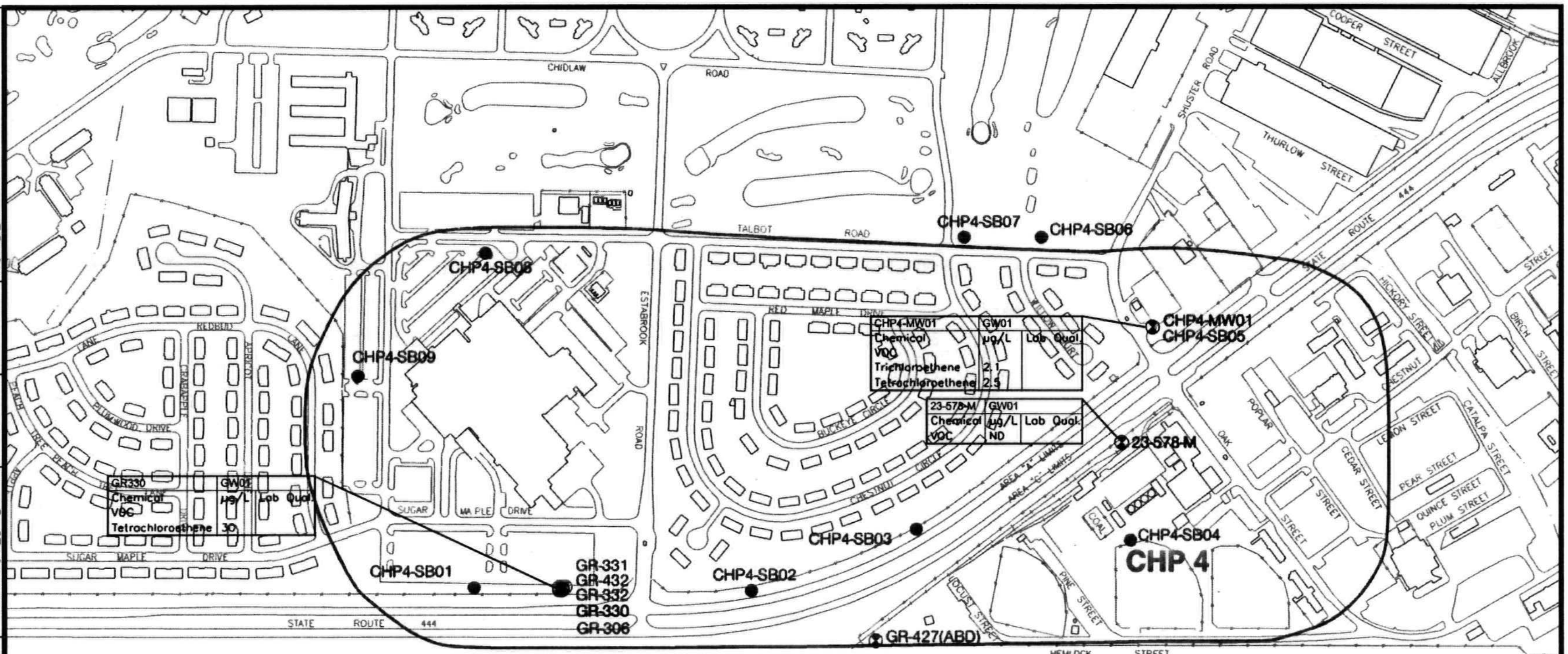
PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

INTERNATIONAL TECHNOLOGY CORPORATION

FILE 9843-13.DWG CLOSED: 3/7/99 AT 8:08 PM

DRAWN BY	MSN 2/26/99	CHECKED BY APPROVED BY	GP 6/22/99	DRAWING NUMBER 9843-14.DWG



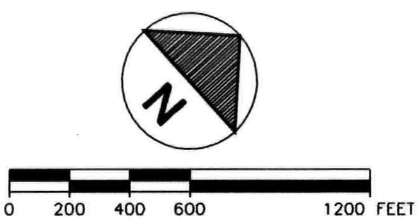


Figure 6-9
Central Heating Plant 4 (OU10)
Detected Chemicals of Concern:
October 1998

PREPARED FOR

Wright-Patterson Air Force Base
Dayton, Ohio

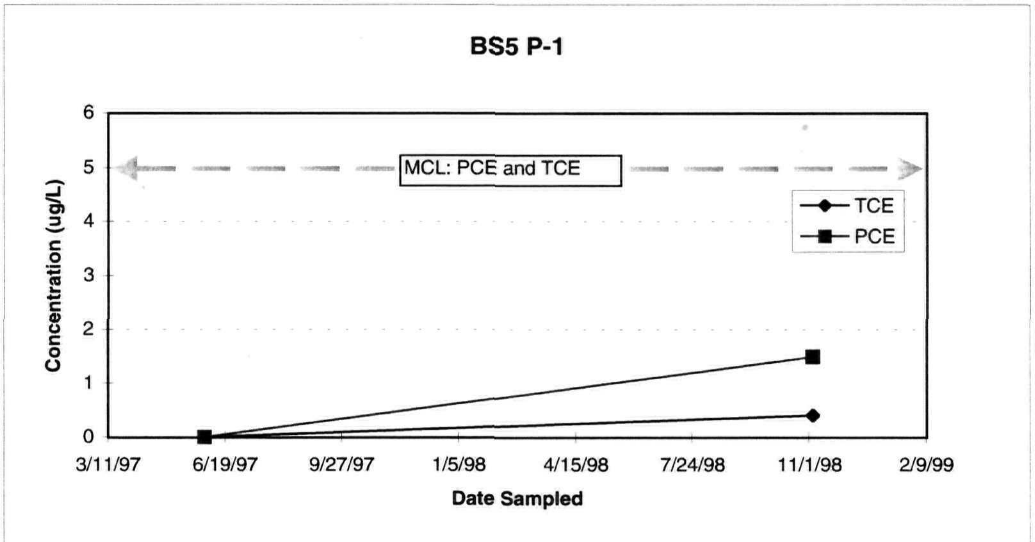
INTERNATIONAL TECHNOLOGY CORPORATION

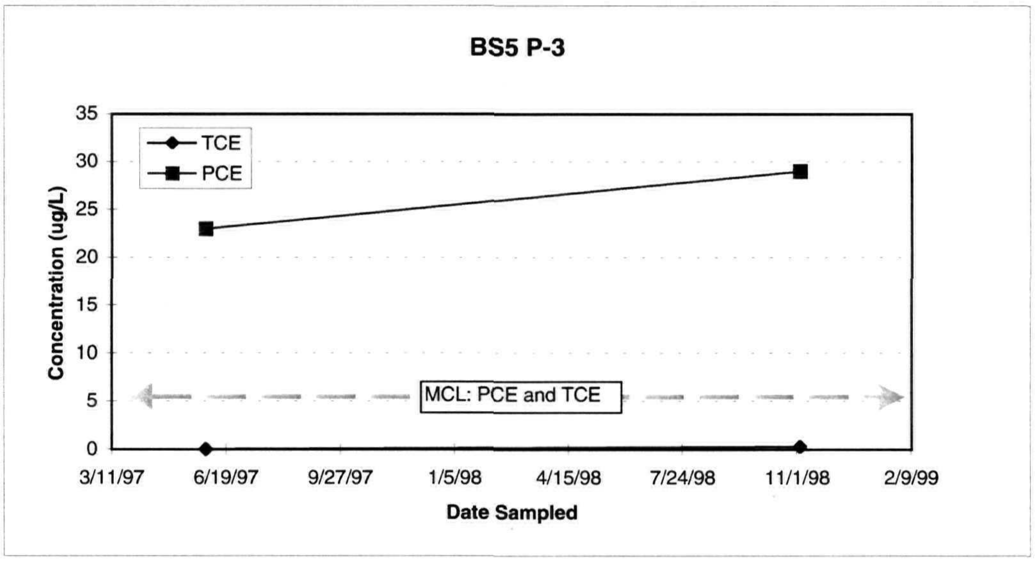
LEGEND

- MONITORING WELL LOCATION
- IRP SITES (LOCATIONS APPROXIMATE)

F '843-14.DWG CLOSED: 6/22/99 AT 7:46 AM

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: BS5
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: BS5
WPAFB - LTM Program

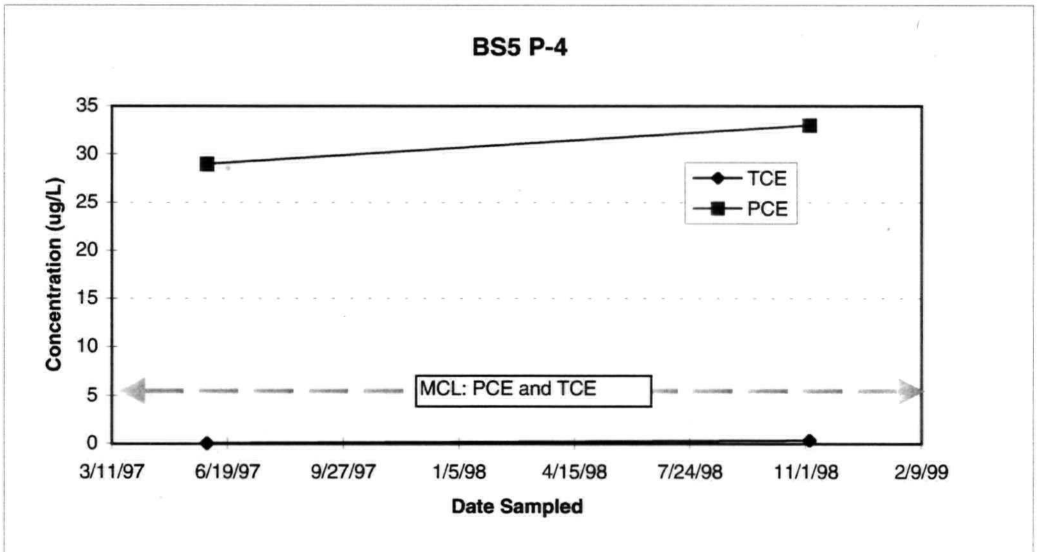
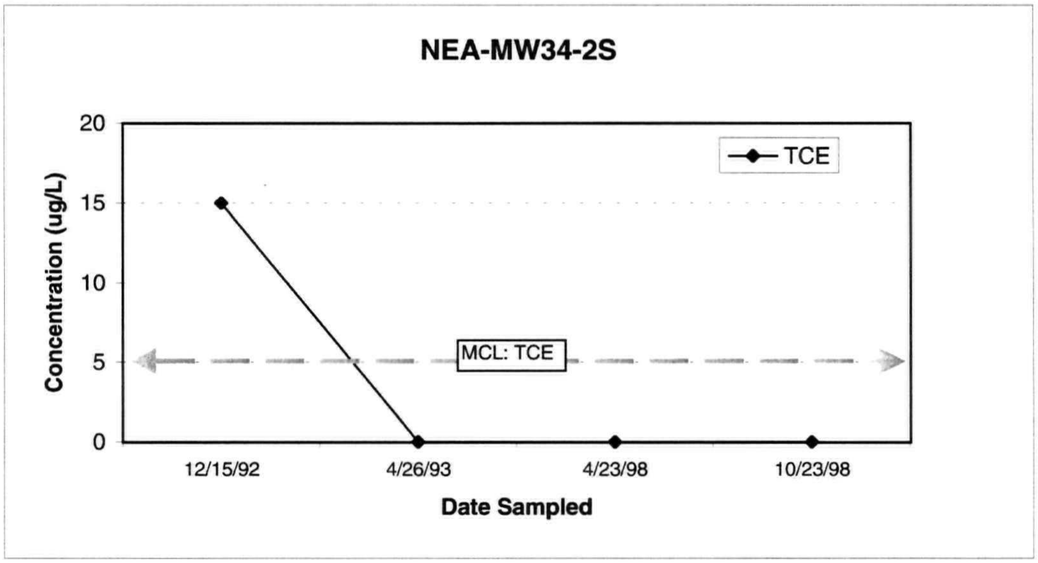


FIGURE 6-11

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU2
WPAFB - LTM Program



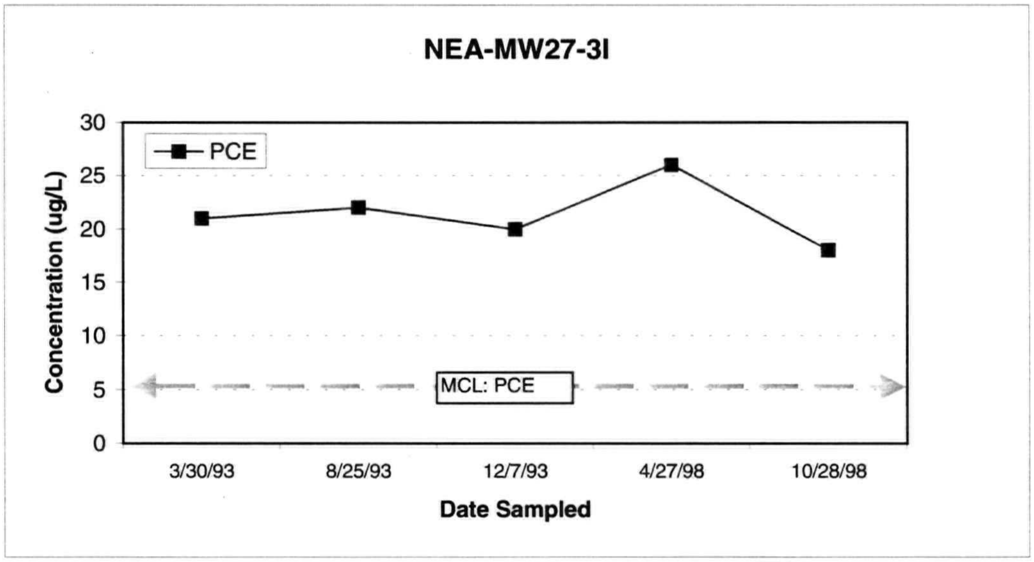
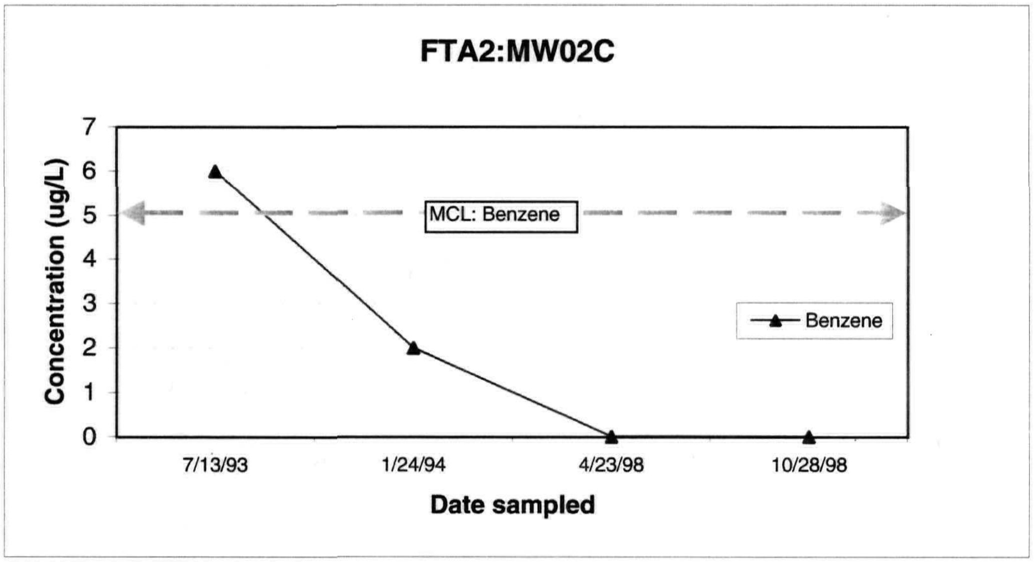


FIGURE 6-12

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU3
WPAFB - LTM Program



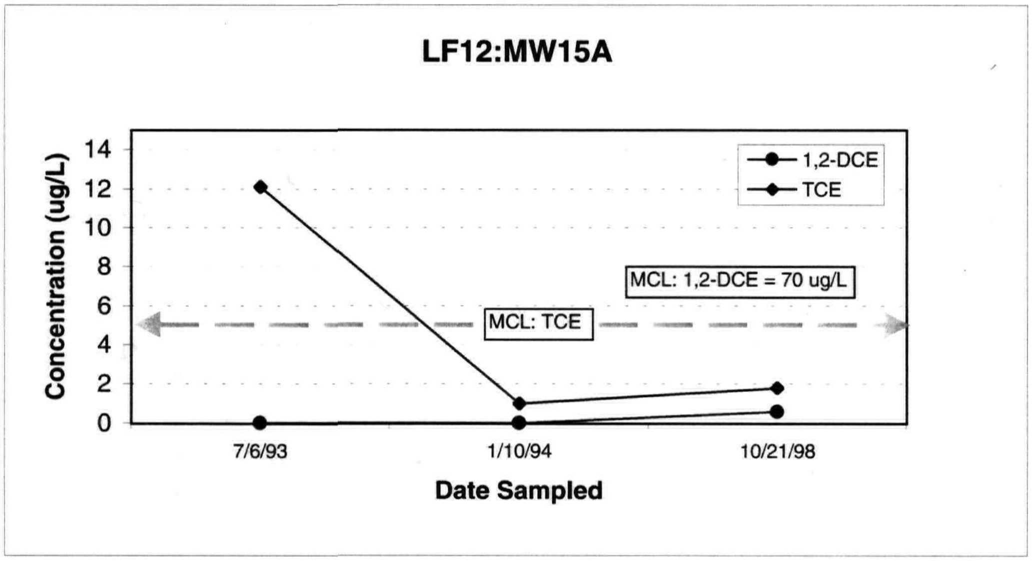
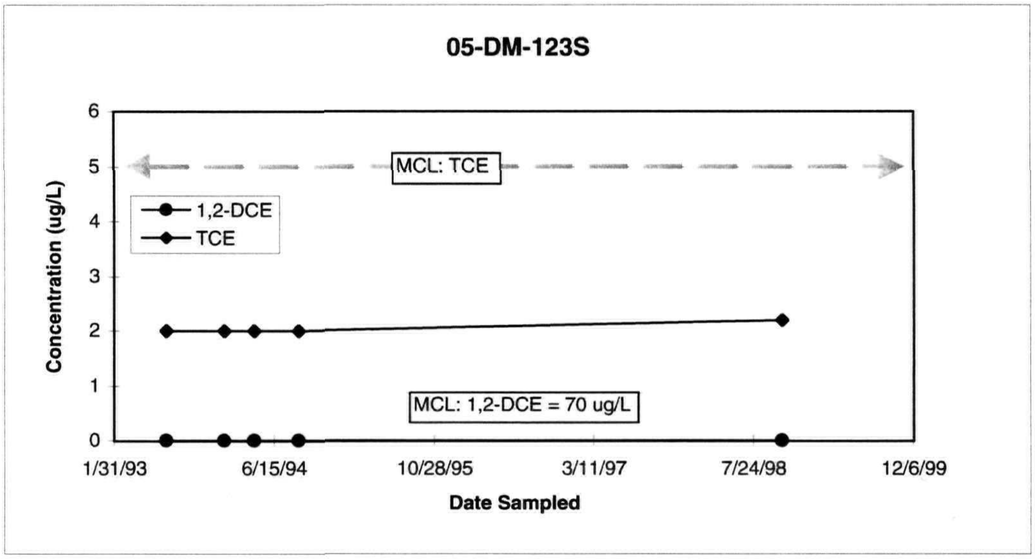


FIGURE 6-13

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU3
WPAFB - LTM Program



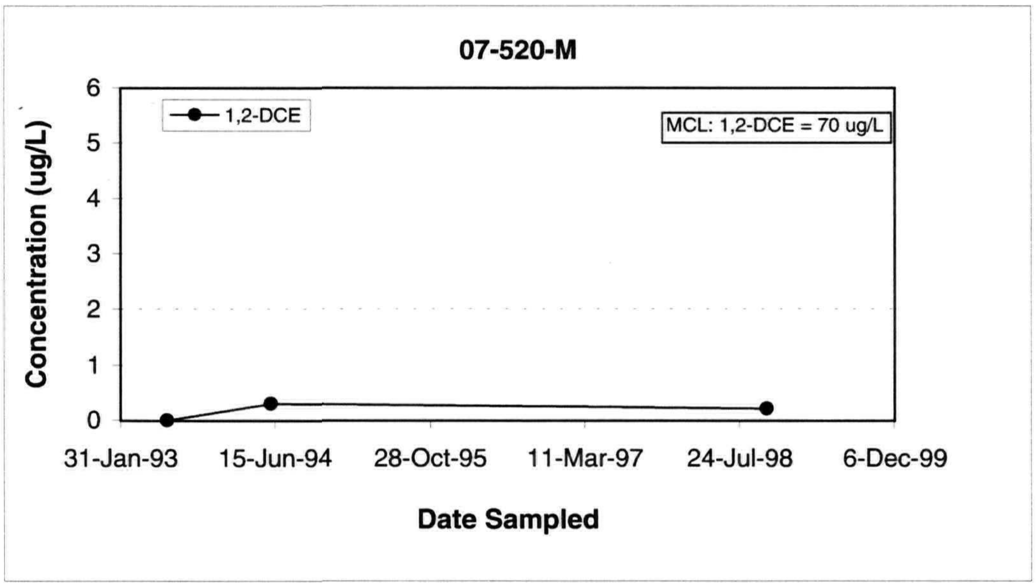
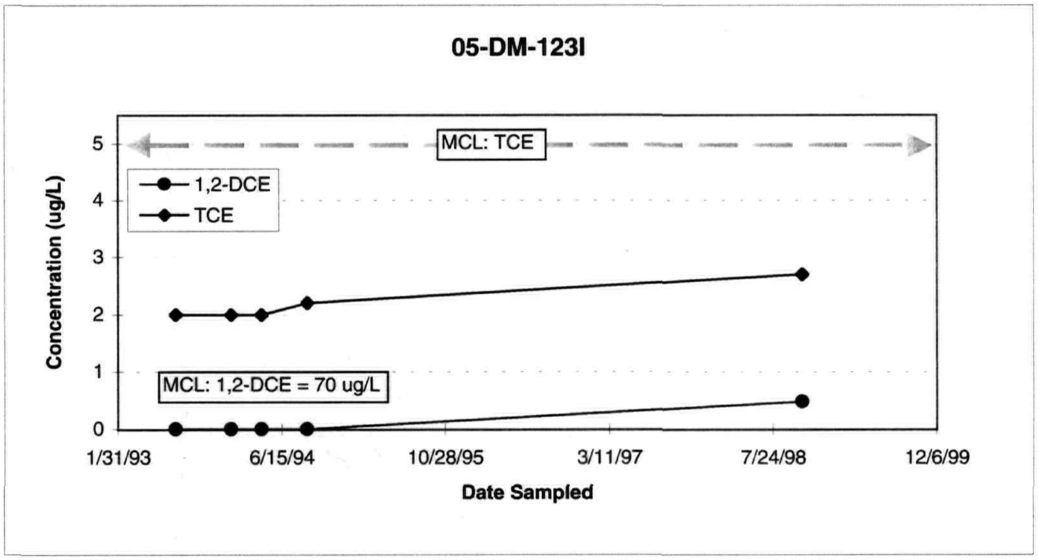
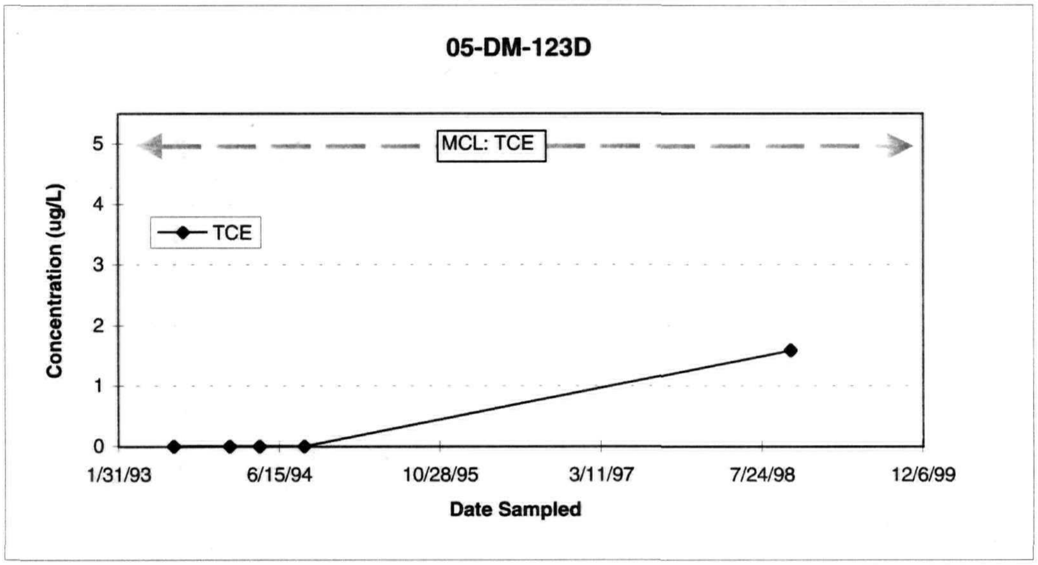


FIGURE 6-14

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU3
WPAFB - LTM Program





common1/plamondo/Ltm/Figures/Rnd1_graphs.xls/OU3(3)

FIGURE 6-15

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU4
WPAFB - LTM Program

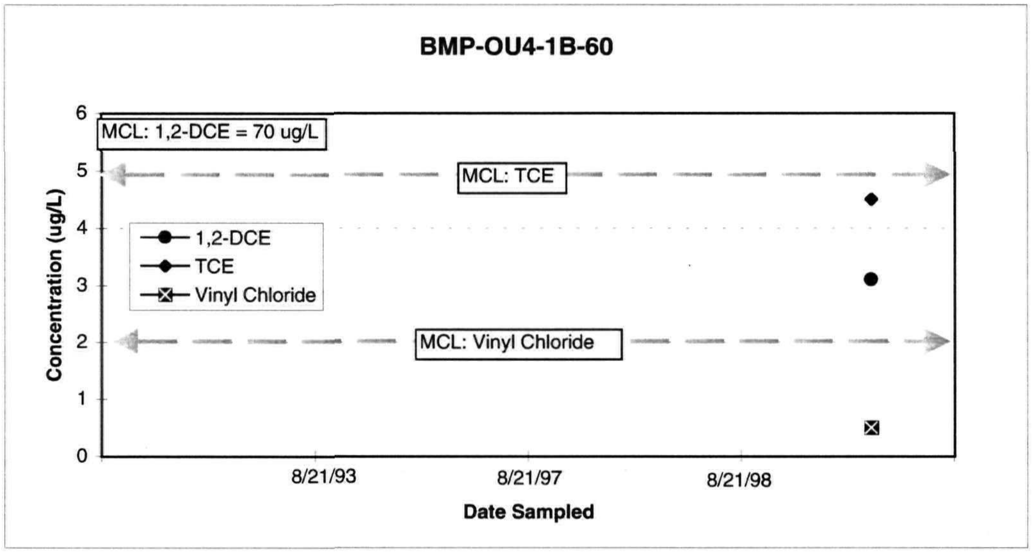
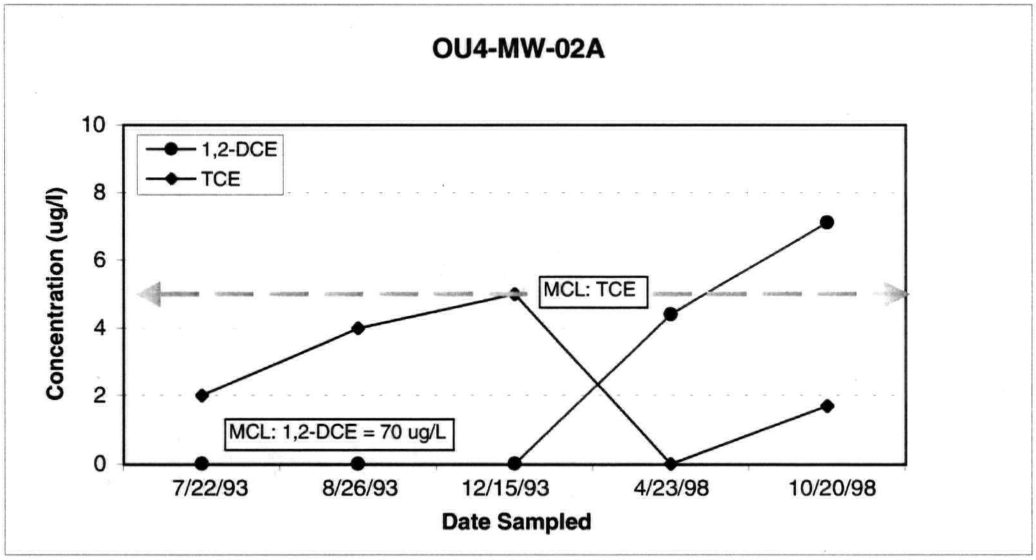
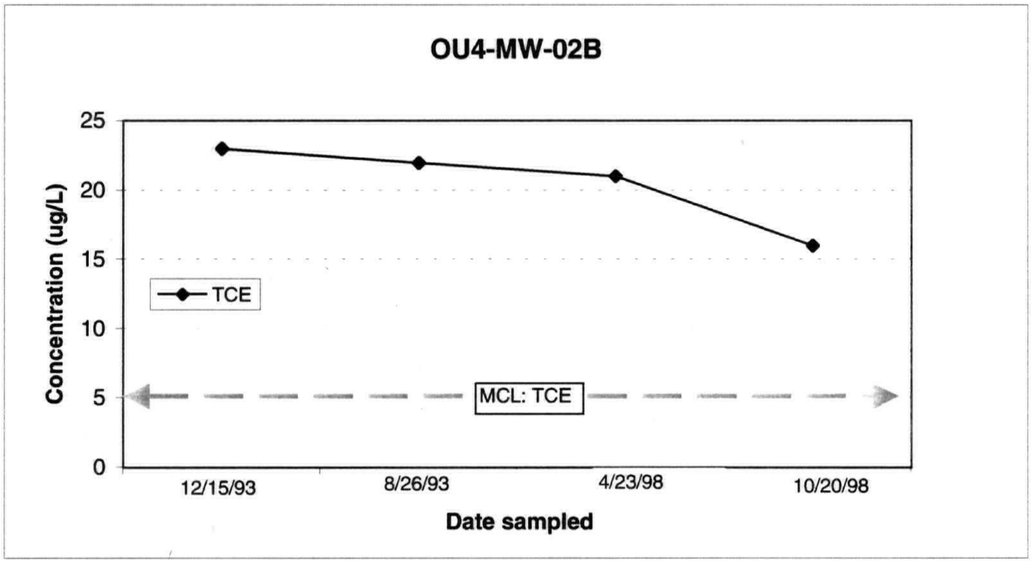


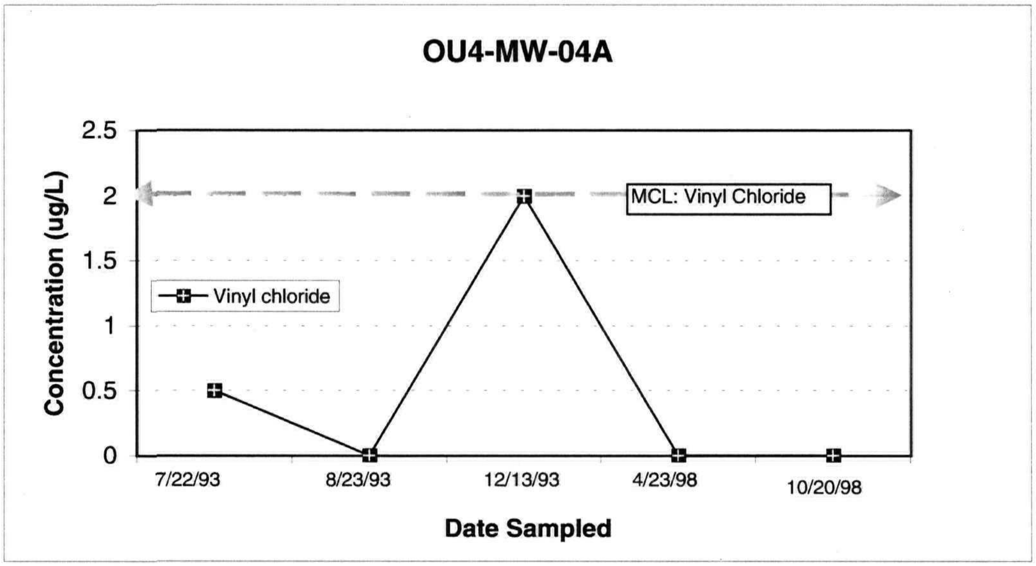
FIGURE 6-16

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU4
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU4
WPAFB - LTM Program



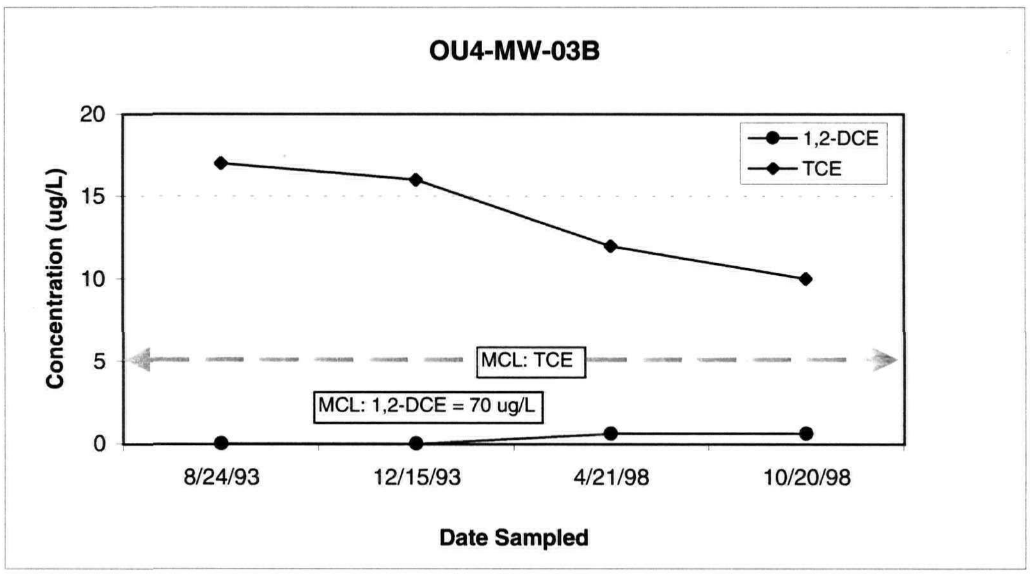
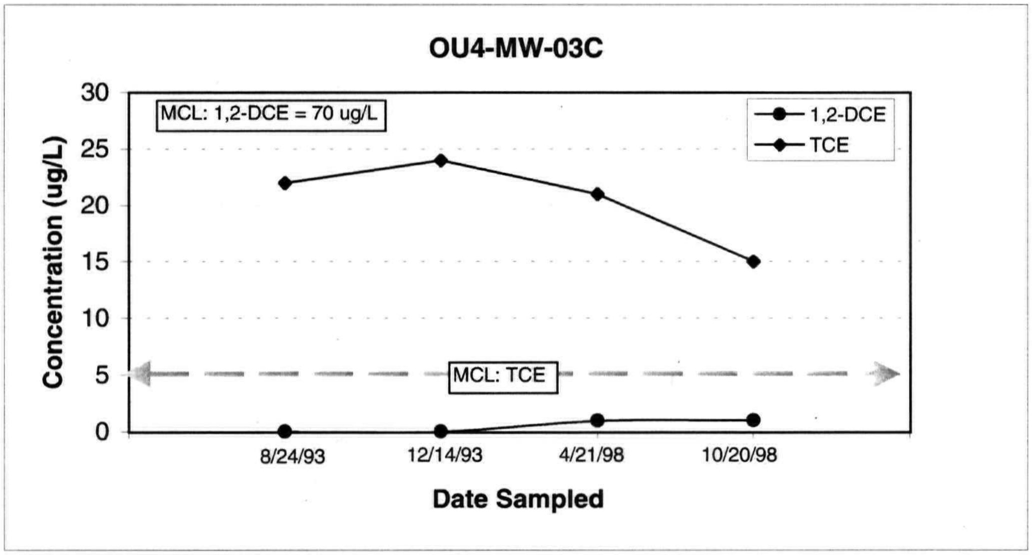
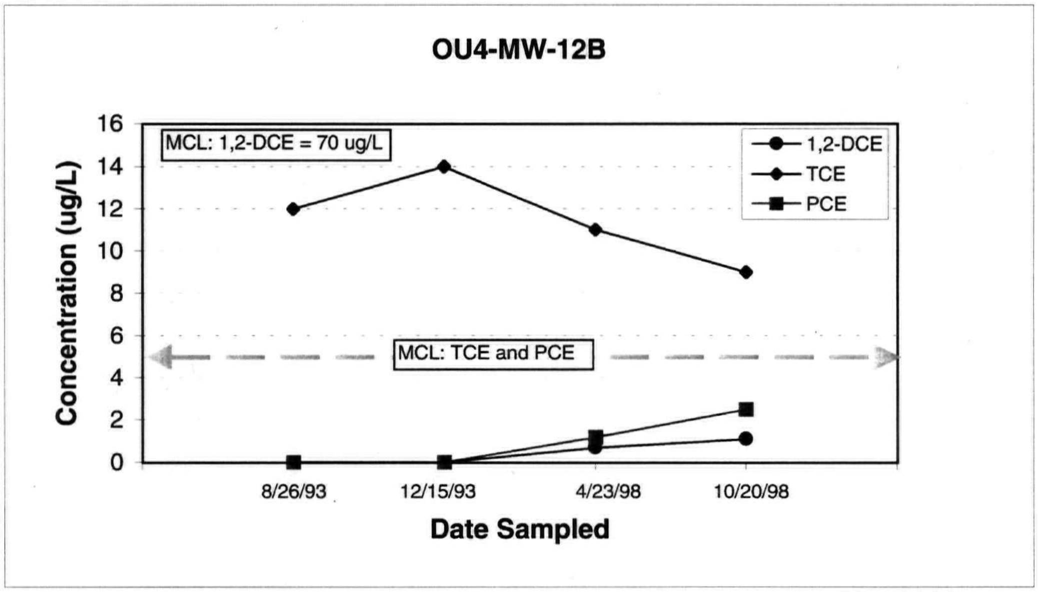


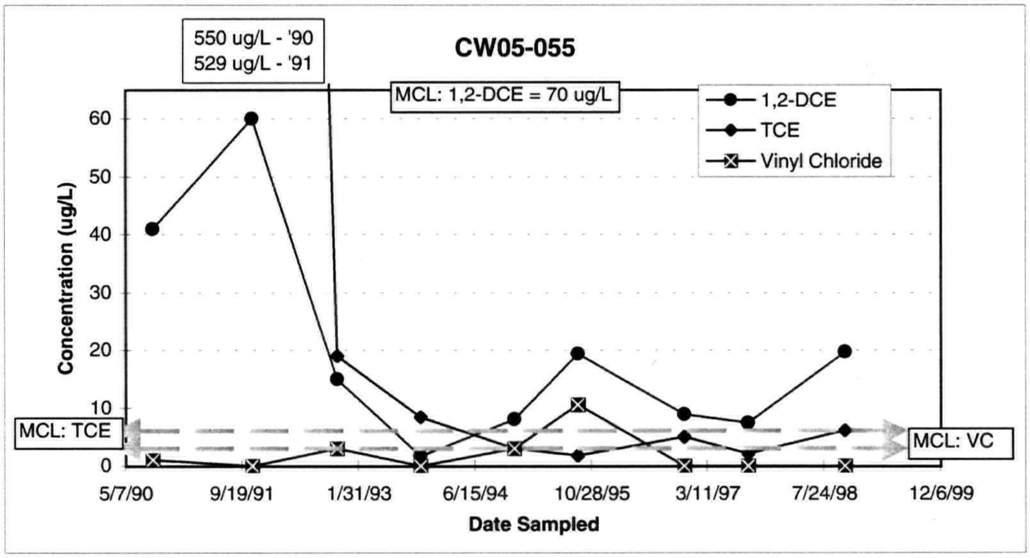
FIGURE 6-18

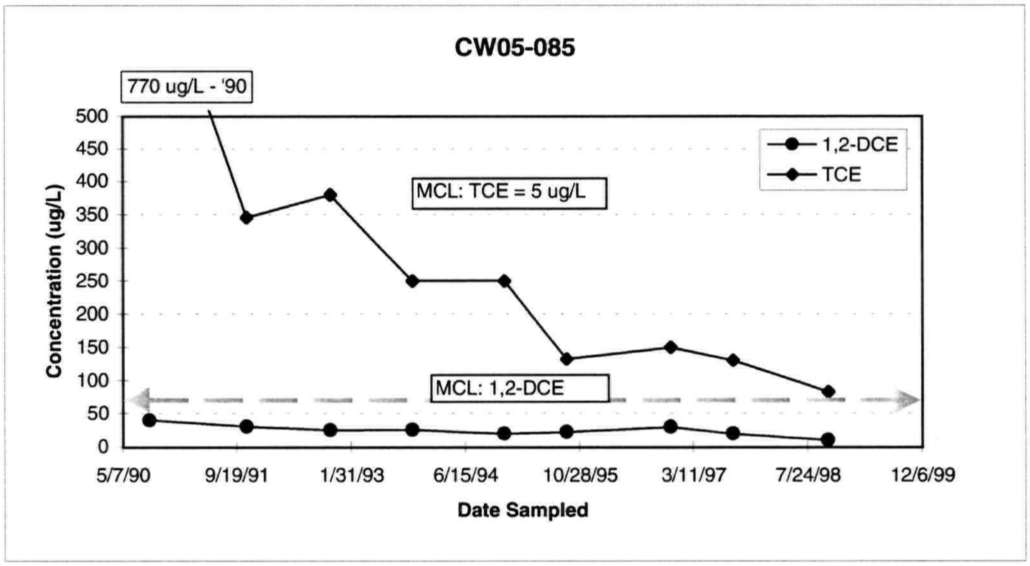
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU4
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5 (FAA-A)
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5 (FAA-A)
WPAFB - LTM Program

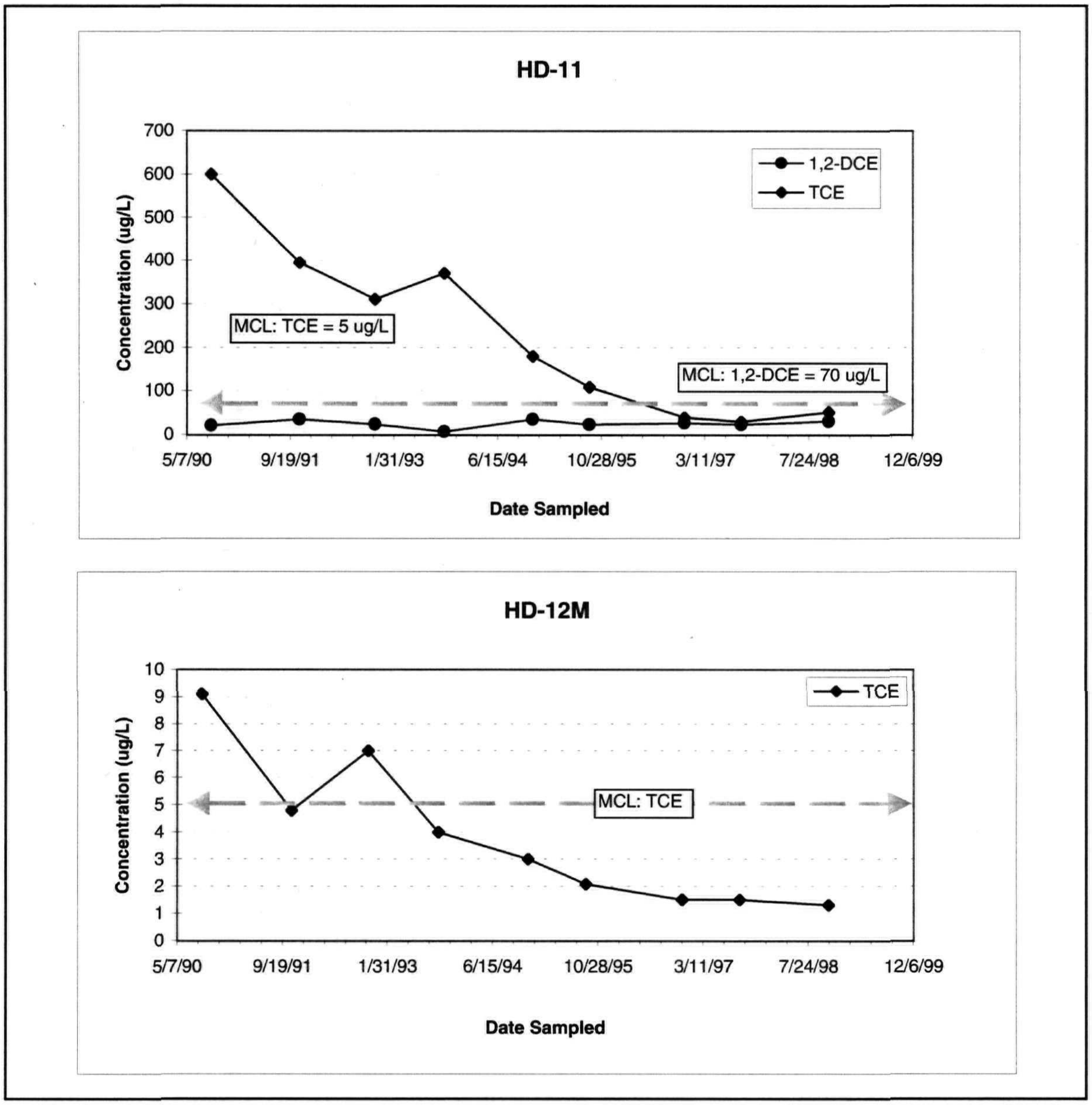
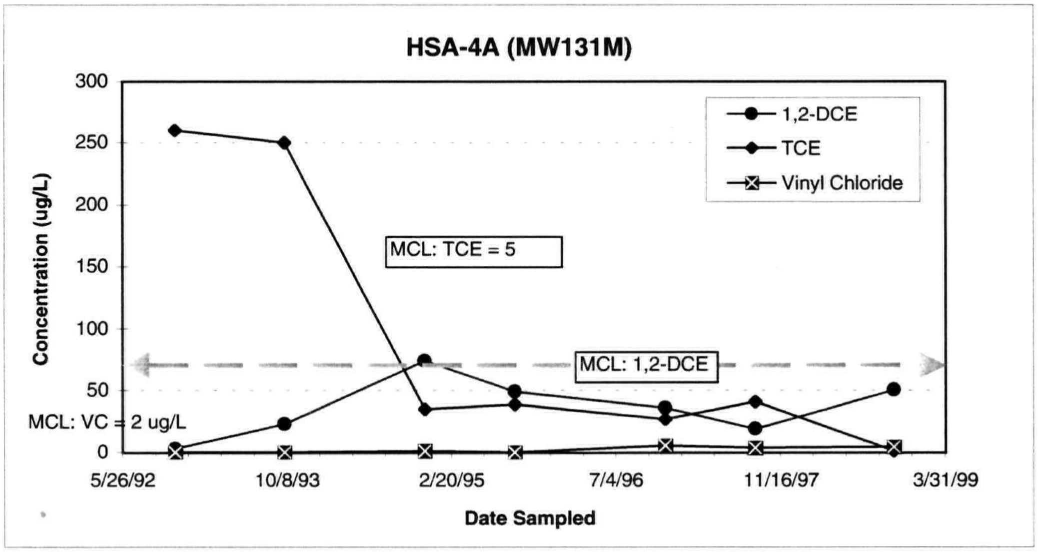
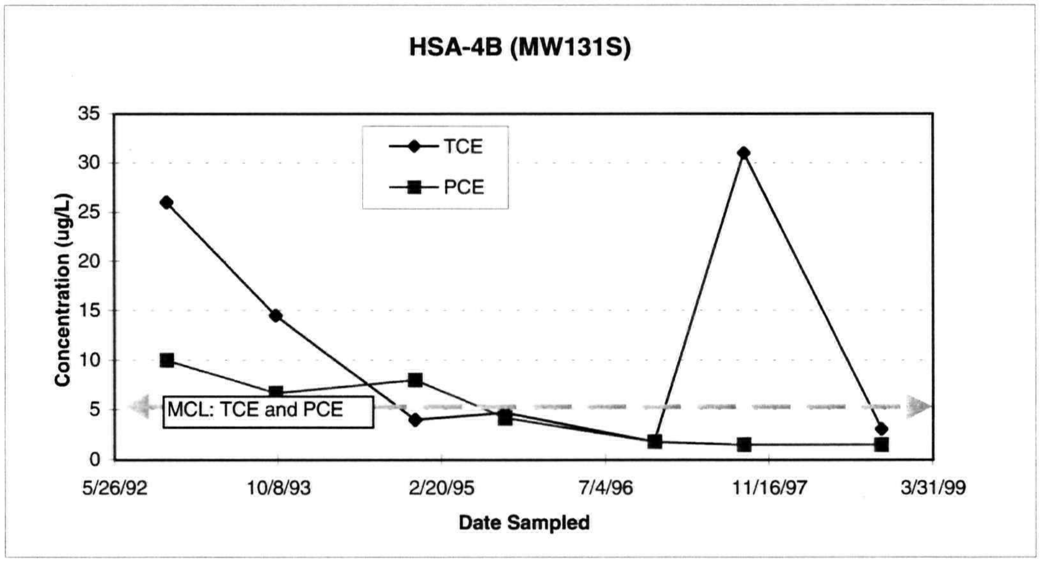


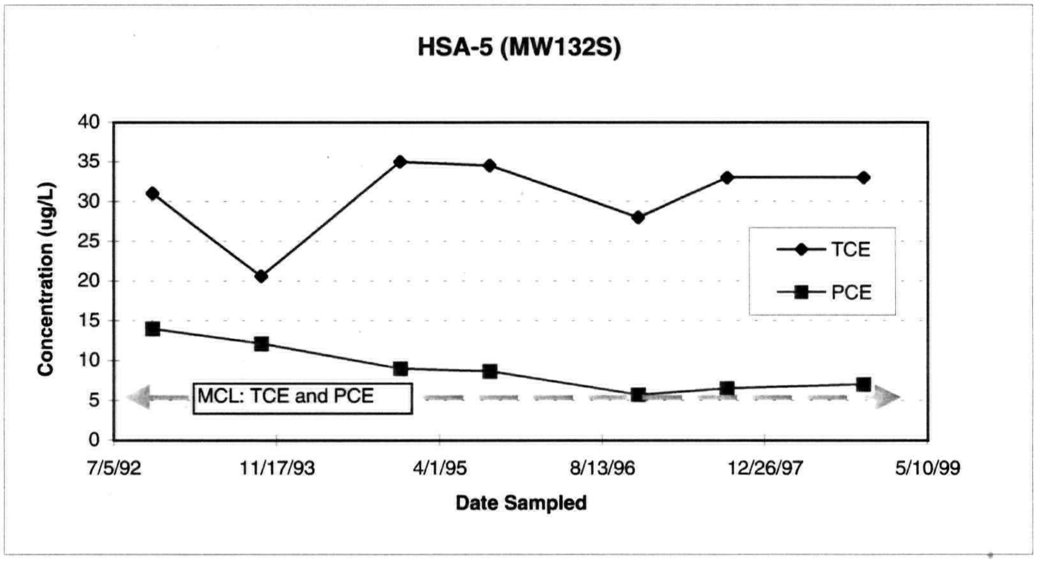
FIGURE 6-21

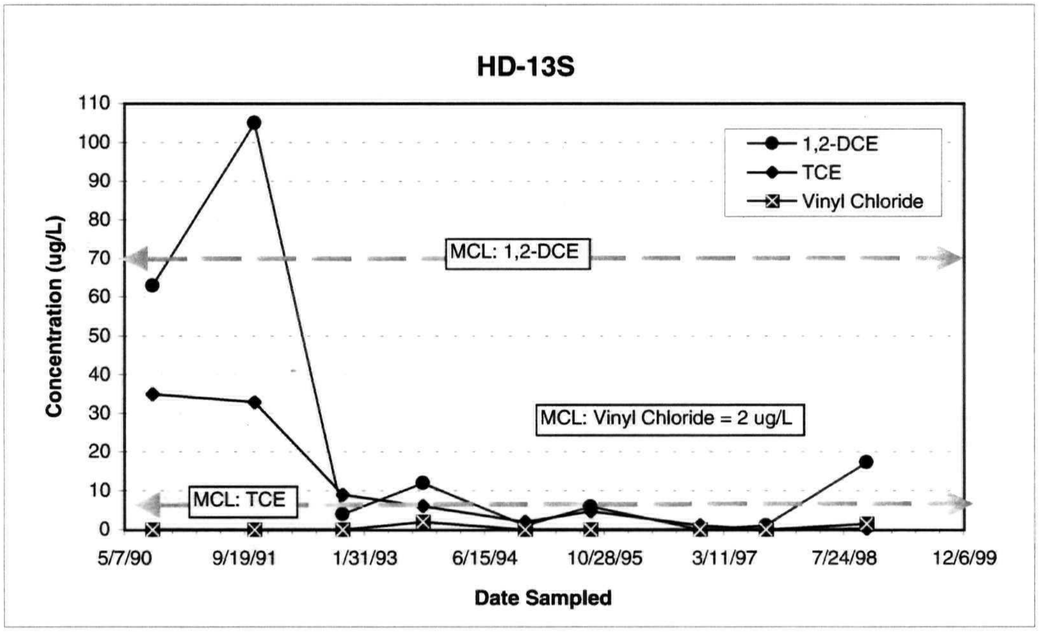
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5 (FAA-A)
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5 (FAA-A)
WPAFB - LTM Program

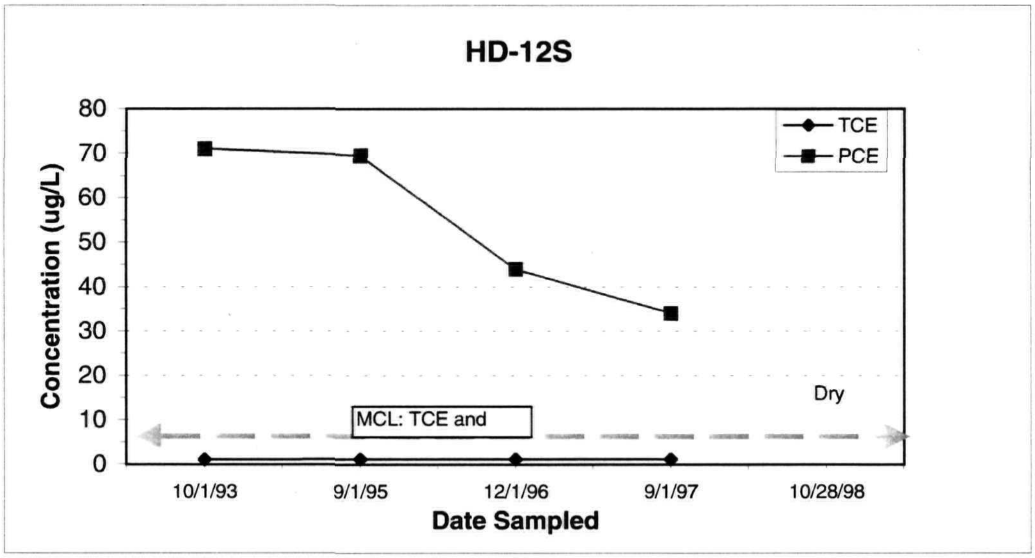




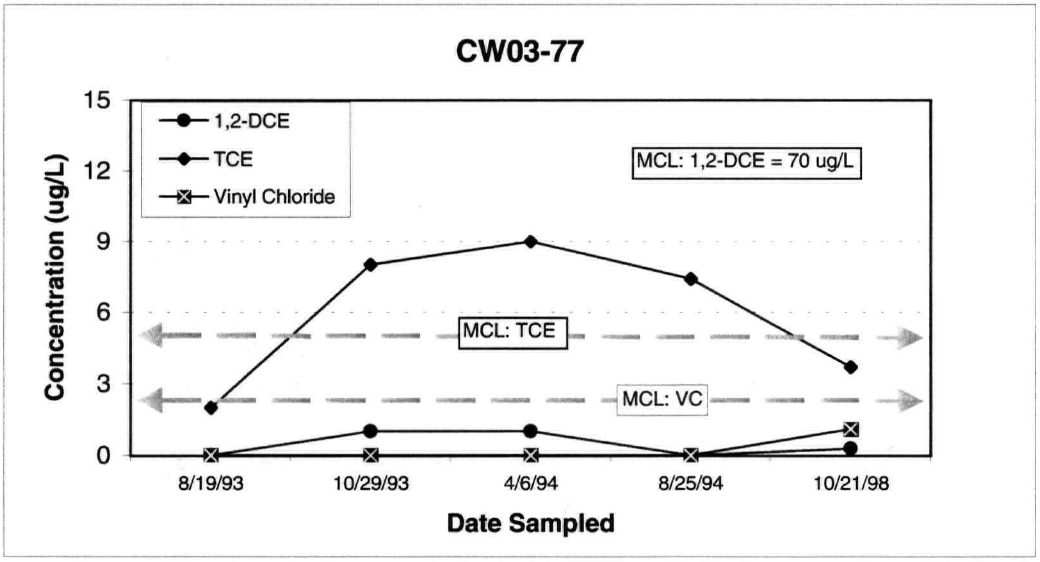
common1/plamondo/Ltm/Figures/Rnd1_graphs.xls/OU5(4)

FIGURE 6-23

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU5
WPAFB - LTM Program



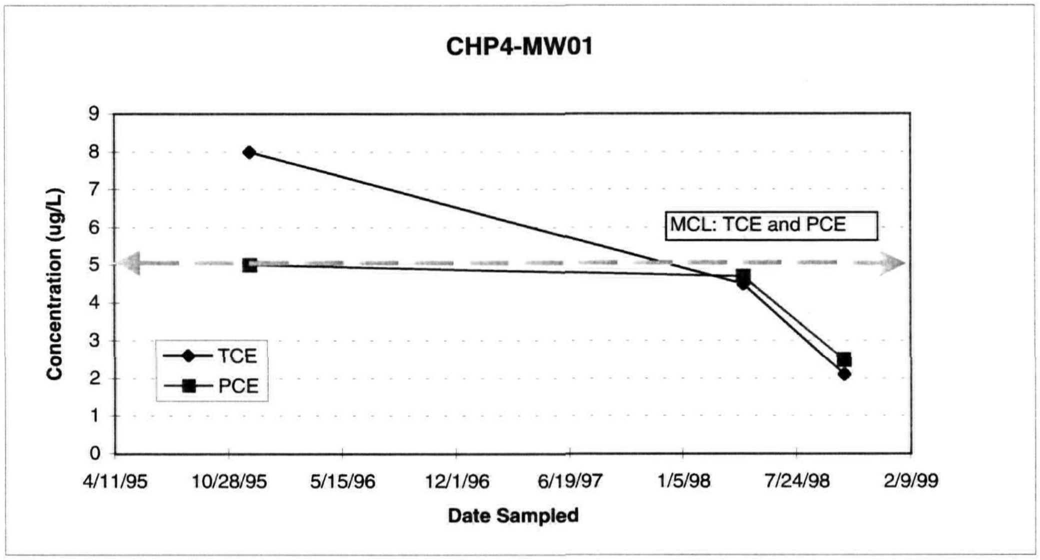
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU8
WPAFB - LTM Program



common1/plamondo/Ltm/Figures/Rnd1_graphs.xls/OU8(2)

FIGURE 6-25

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program



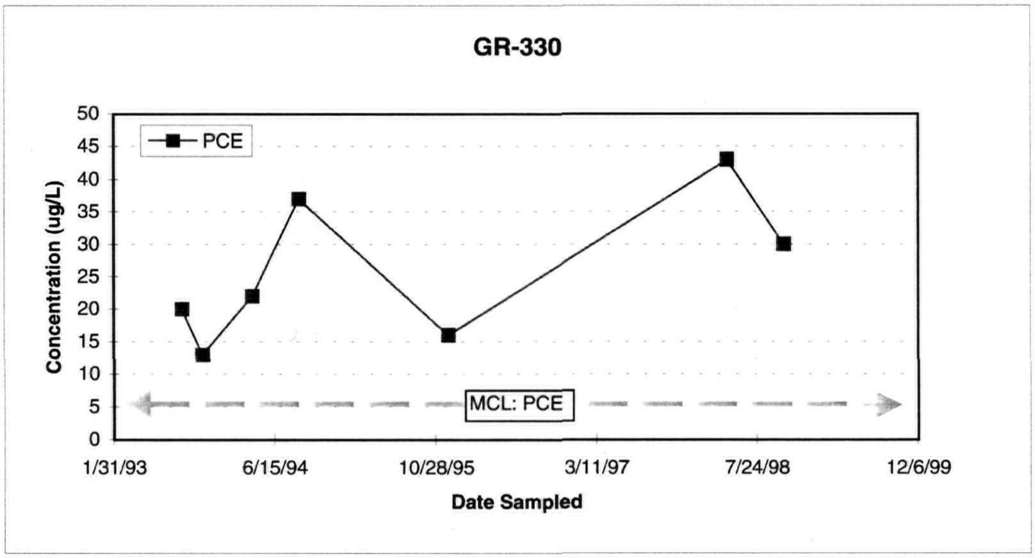
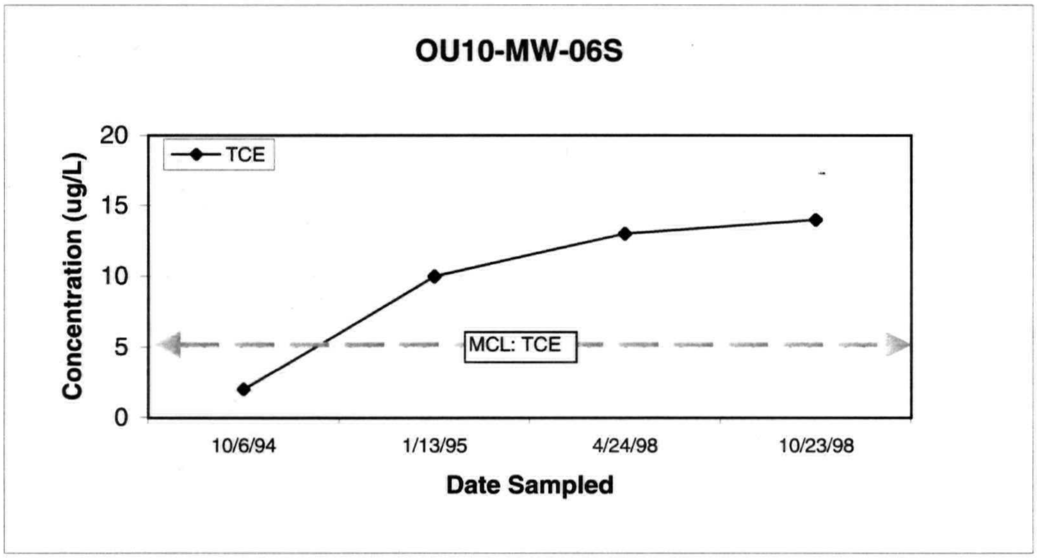
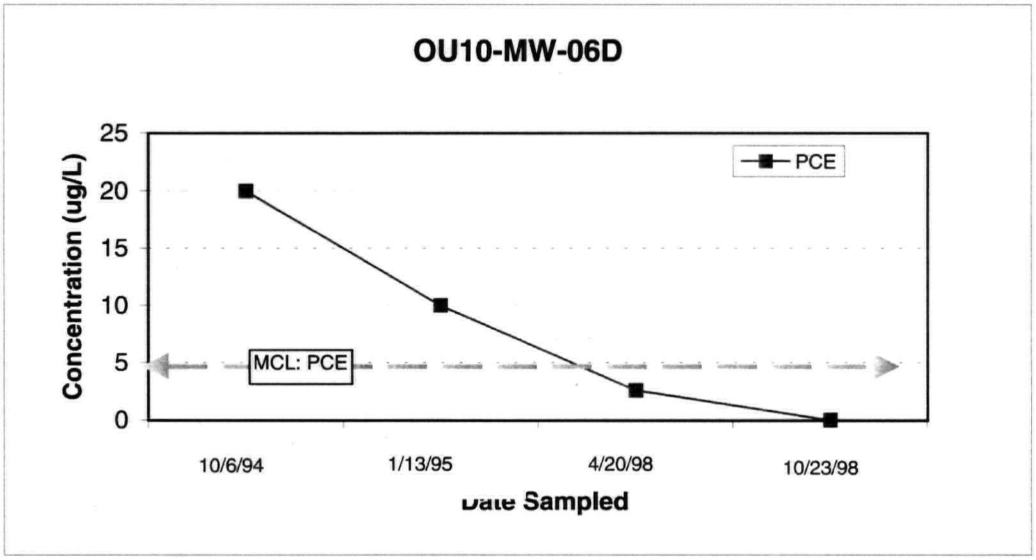


FIGURE 6-26

LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program

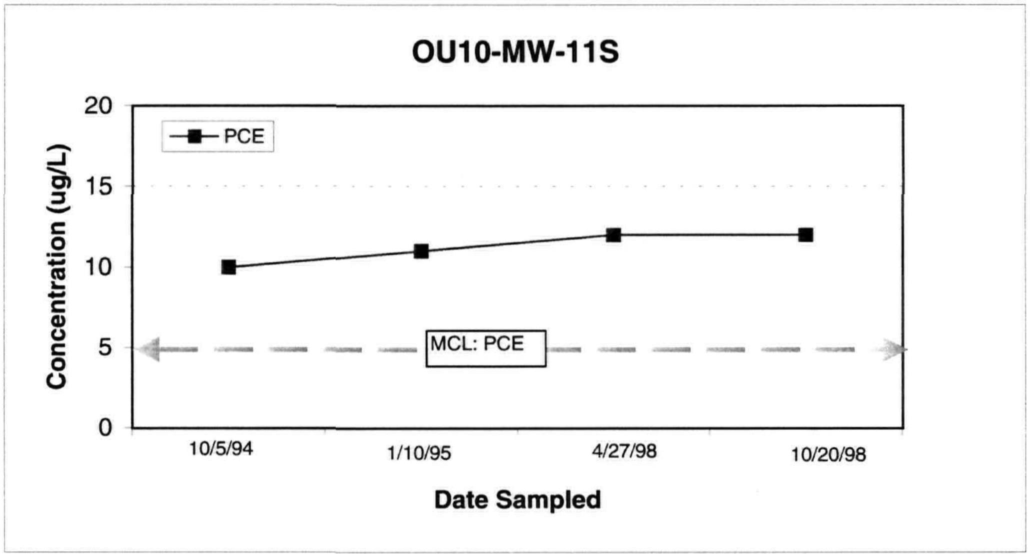


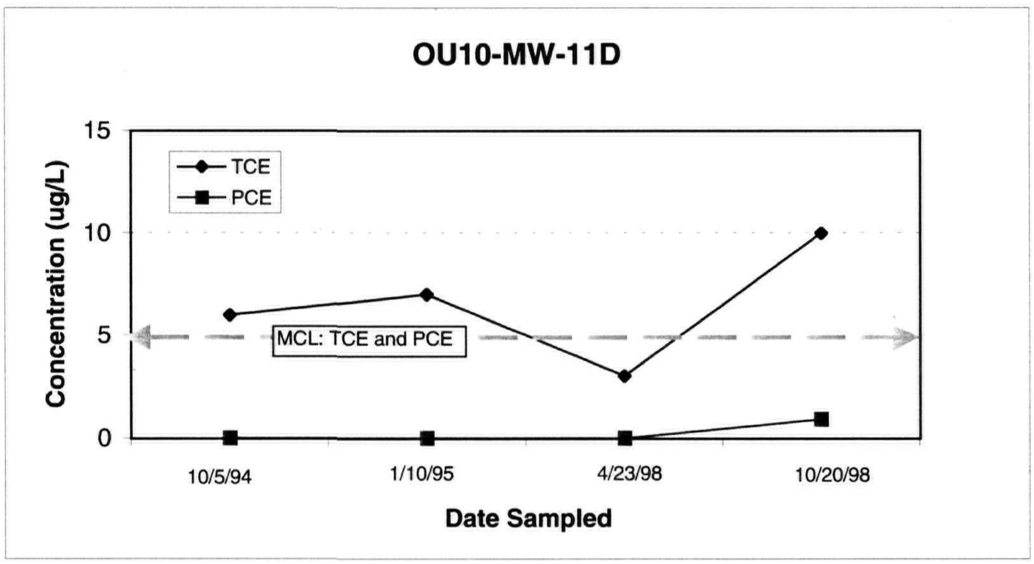


common1/plamondo/Ltm/Figures/Rnd1_graphs.xls/OU10(a)

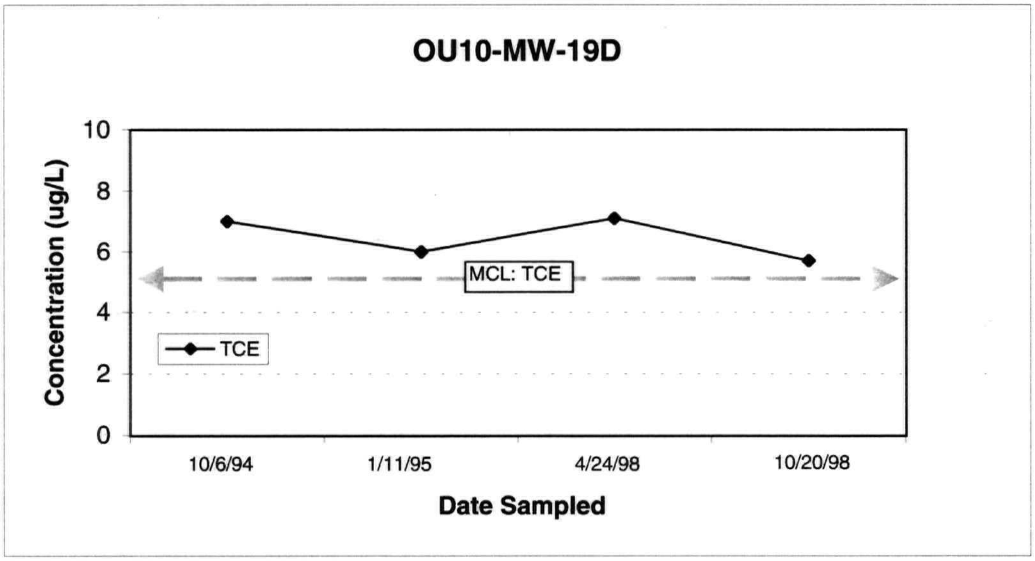
FIGURE 6-27

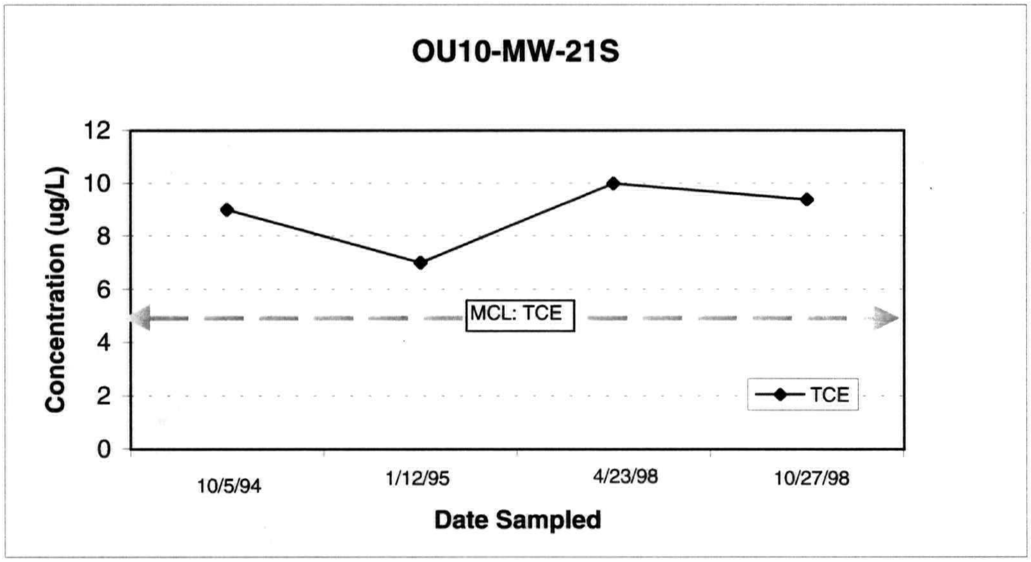
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program

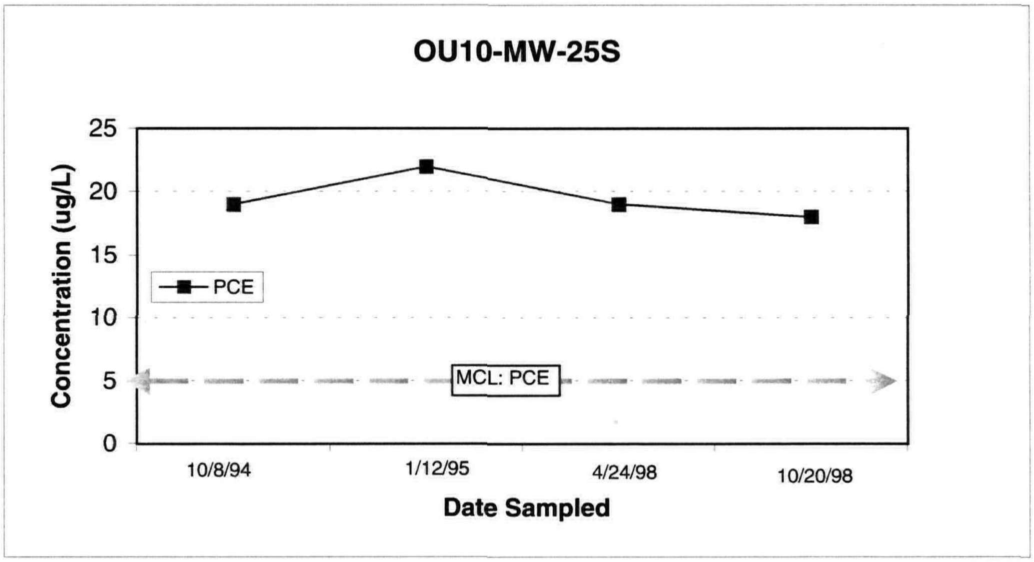


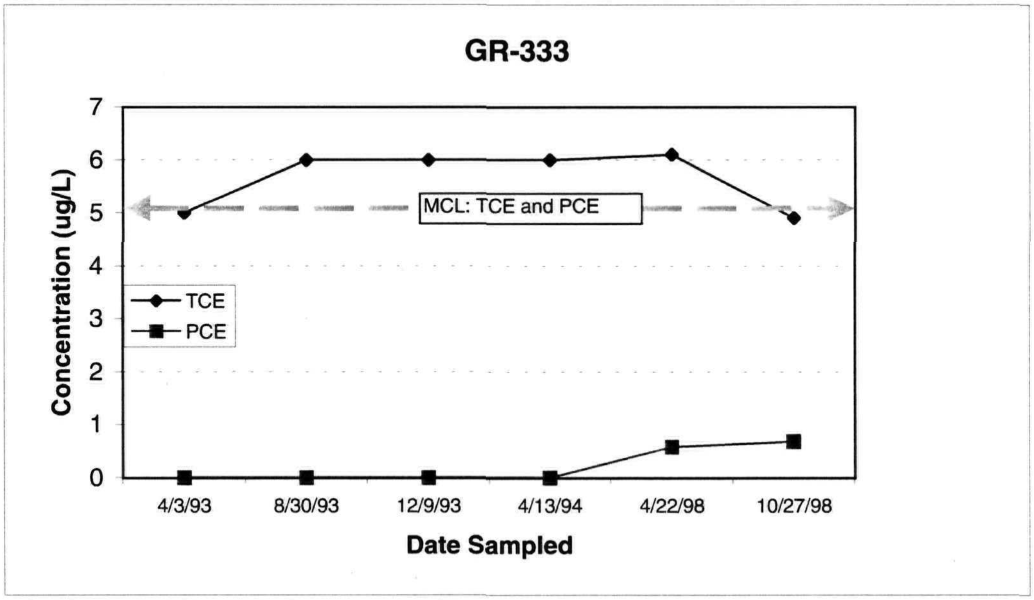


common1/plamondo/Ltm/Figures/Rnd1_graphs.xls/OU10(c)

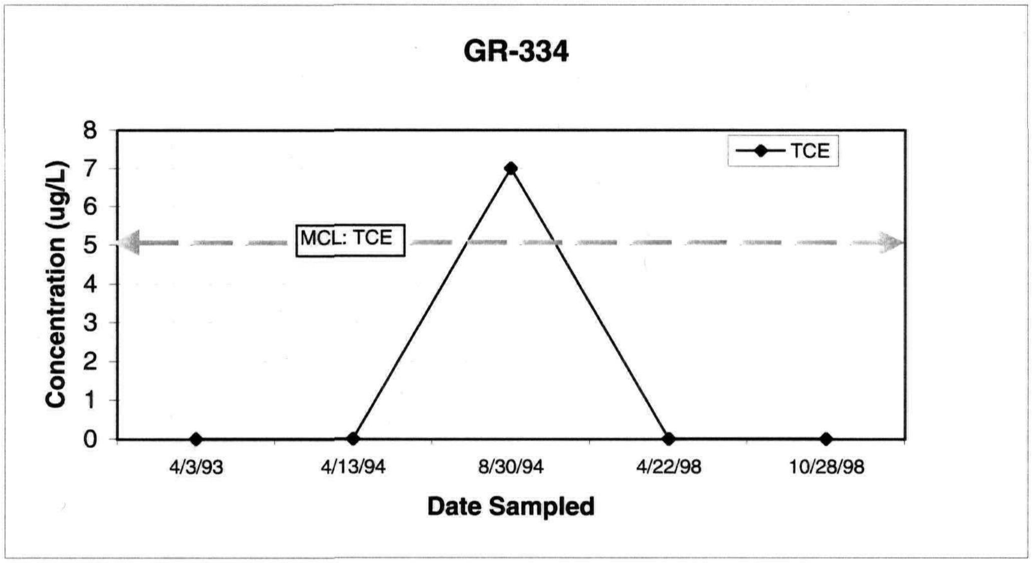
FIGURE 6-29

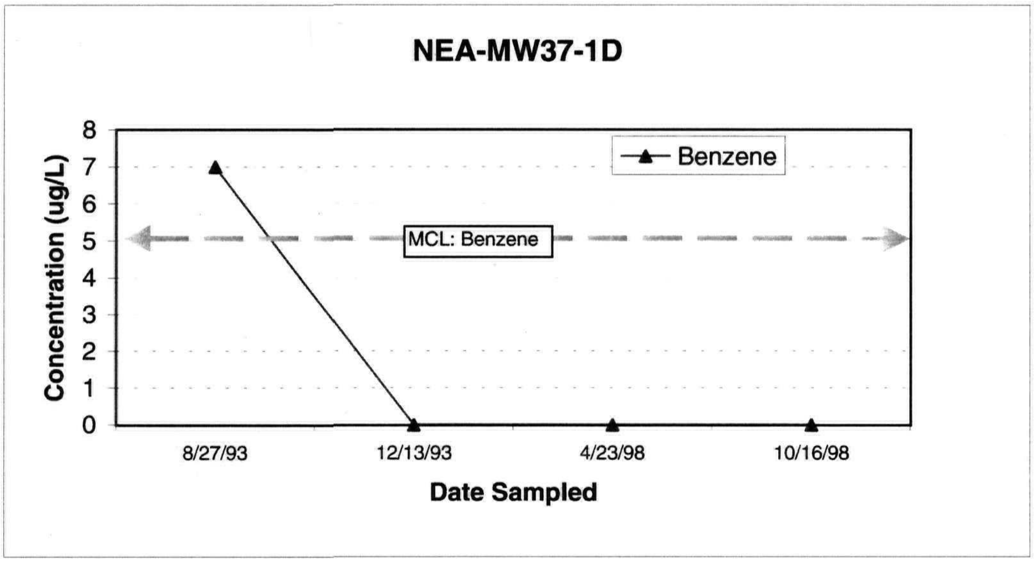
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program



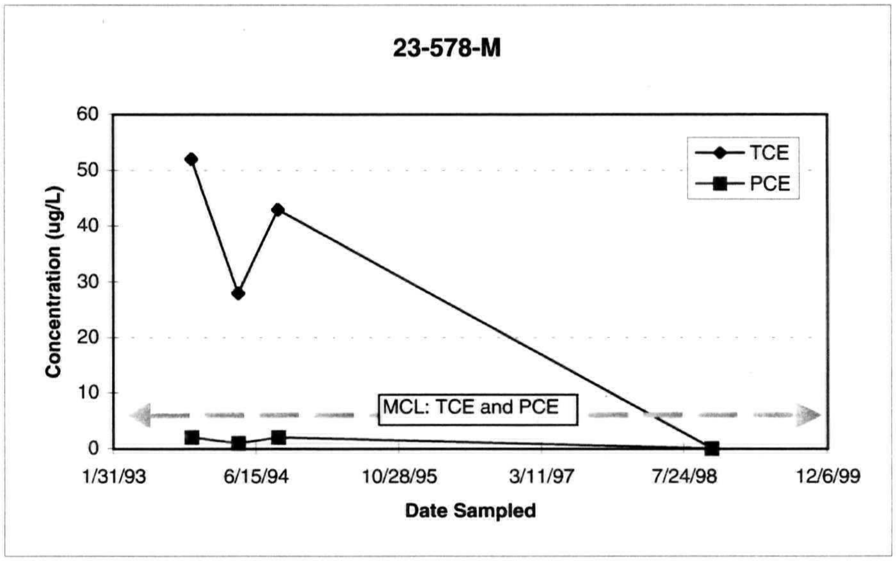


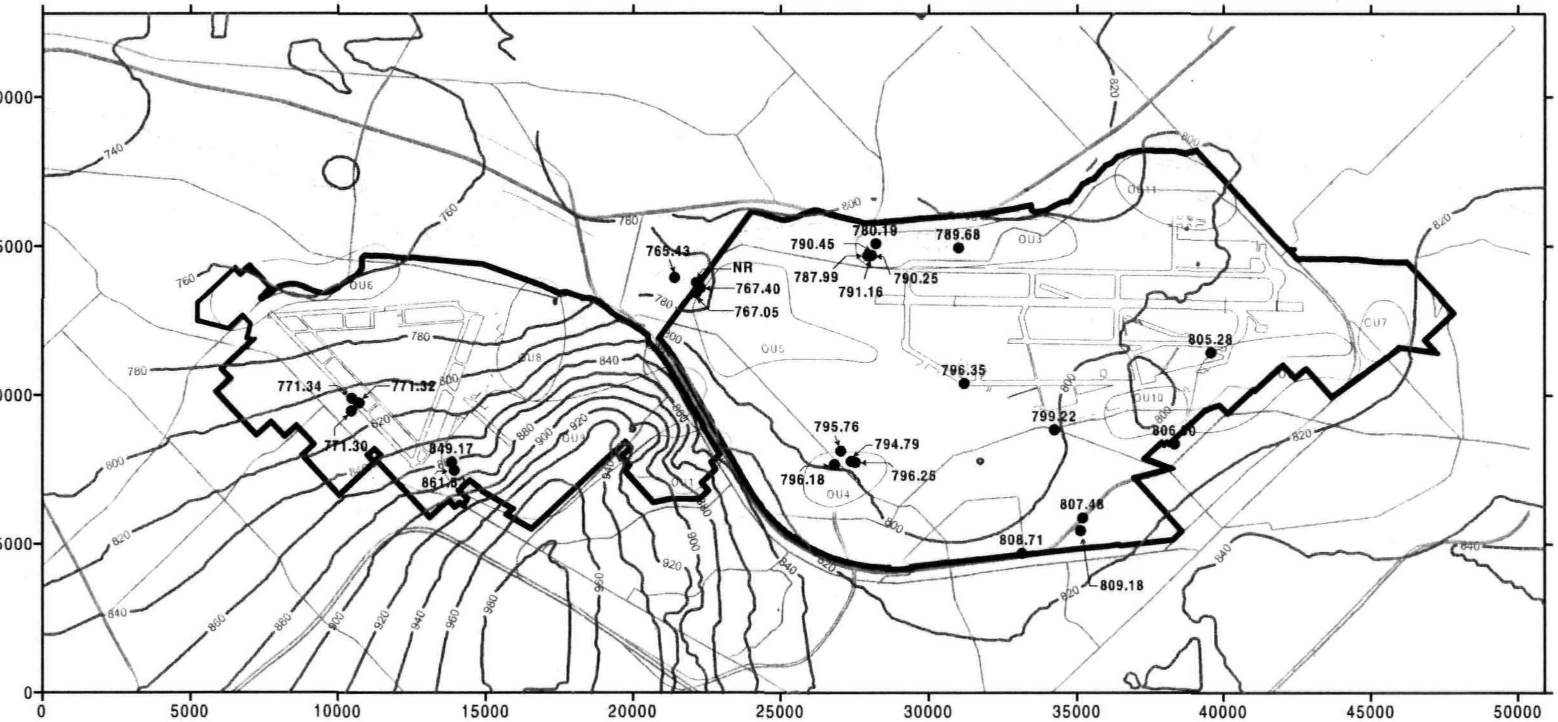
LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program





LONG-TERM MONITORING GRAPHS:
Chemicals of Primary Concern
Area: OU10
WPAFB - LTM Program





LEGEND

Stream

Base Boundary

Roadways/Runways

Operable Unit (OU) Boundaries

Potetiomteric Surface Contours from BMP using July 1995 data

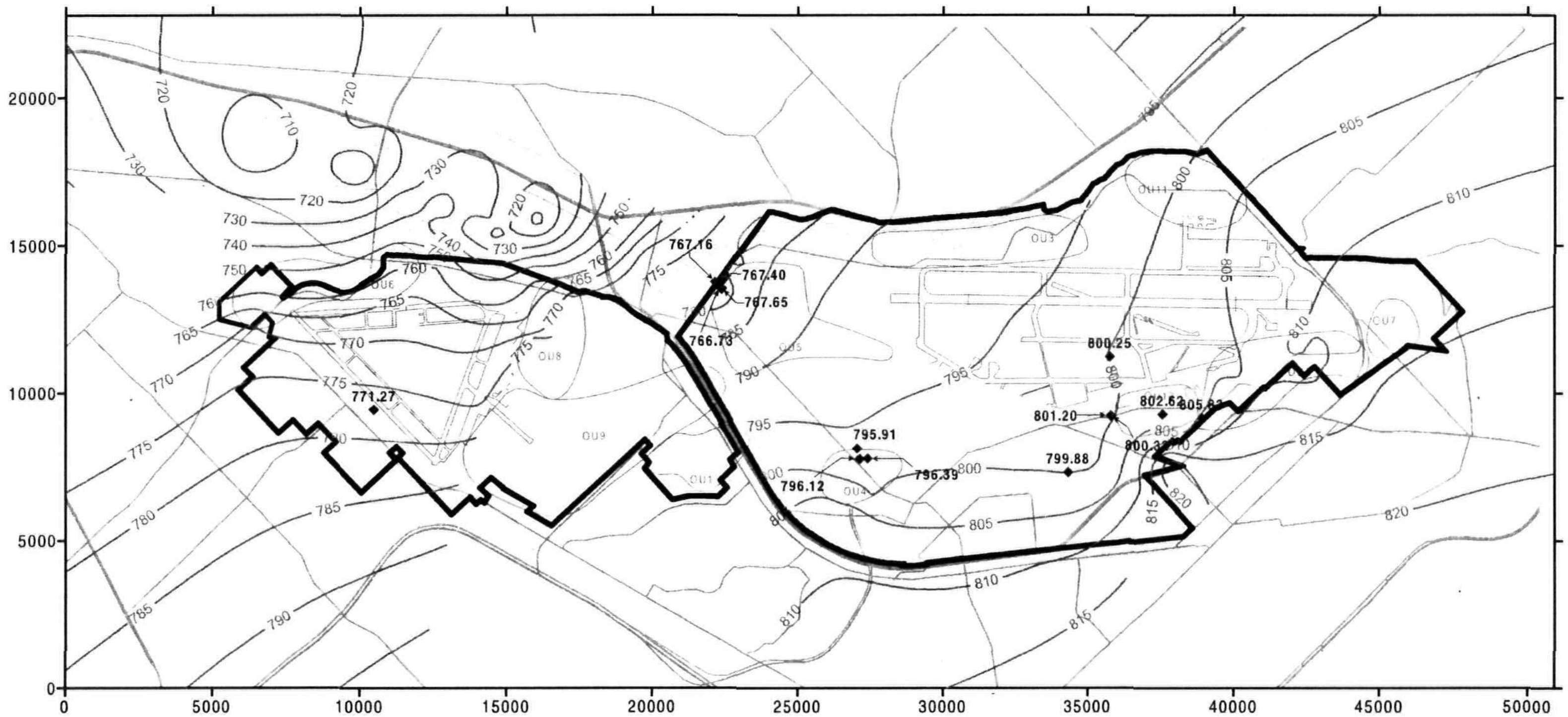
Water Level from October 1998 LTM (in feet)

SCALE

0 2000 4000 6000 8000

(ft)

IT IT CORPORATION	11499 CHESTER ROAD CINCINNATI, OHIO 45246	
SCALE: 1" = 4,000 ft		SHEET NO. Figure 7-1 Groundwater Head Map LTM Fall of 1998 Layer 1
DRAWN: JMM	CHECKED:	
P/N:		
DATE: 02/22/99		
DWG NO.		



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Potetiomteric Surface Contours from BMP using July 1995 data
- ◆ Water Level from October 1998 LTM (in feet)

SCALE

0 2000 4000 6000 8000

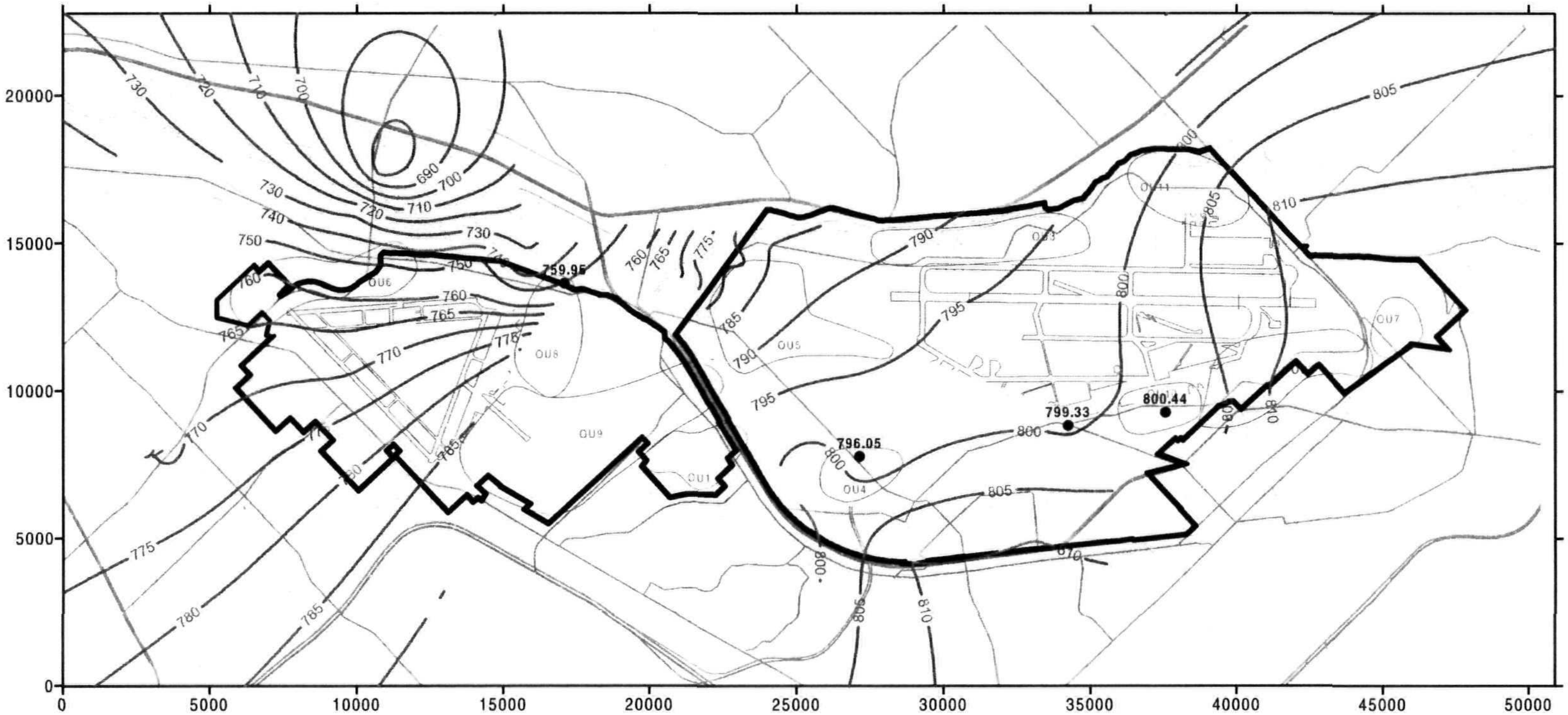
(ft)

IT

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft		SHEET NO.
DRAWN: JMM	CHECKED:	**Figure 7-2 Groundwater Head Map LTM Fall of 1998 Layer 2**
P/N:		
DATE: 02/22/99		
DWG. NO.		



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Potetiomteric Surface Contours from BMP using July 1995 data
- ● Water Level from October 1998 LTM (in feet)

SCALE

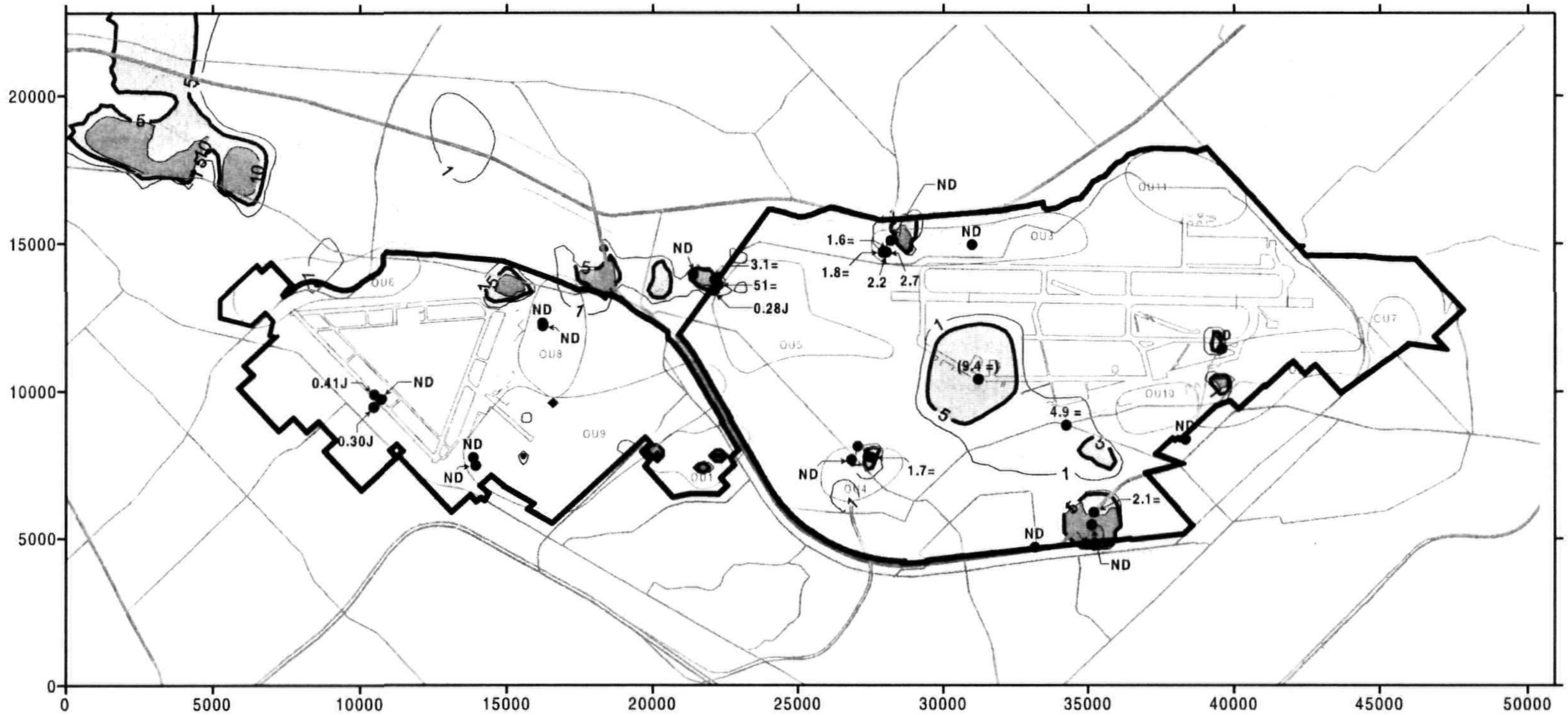
0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM CHECKED:	**Figure 7-3 Groundwater Head Map LTM Fall of 1998 Layer 3**
P/N:	
DATE: 02/22/99	
DWG. NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct. '98 conc. in ug/L)
- Layer 2 Well (Oct. '98 conc. in ug/L)
- Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

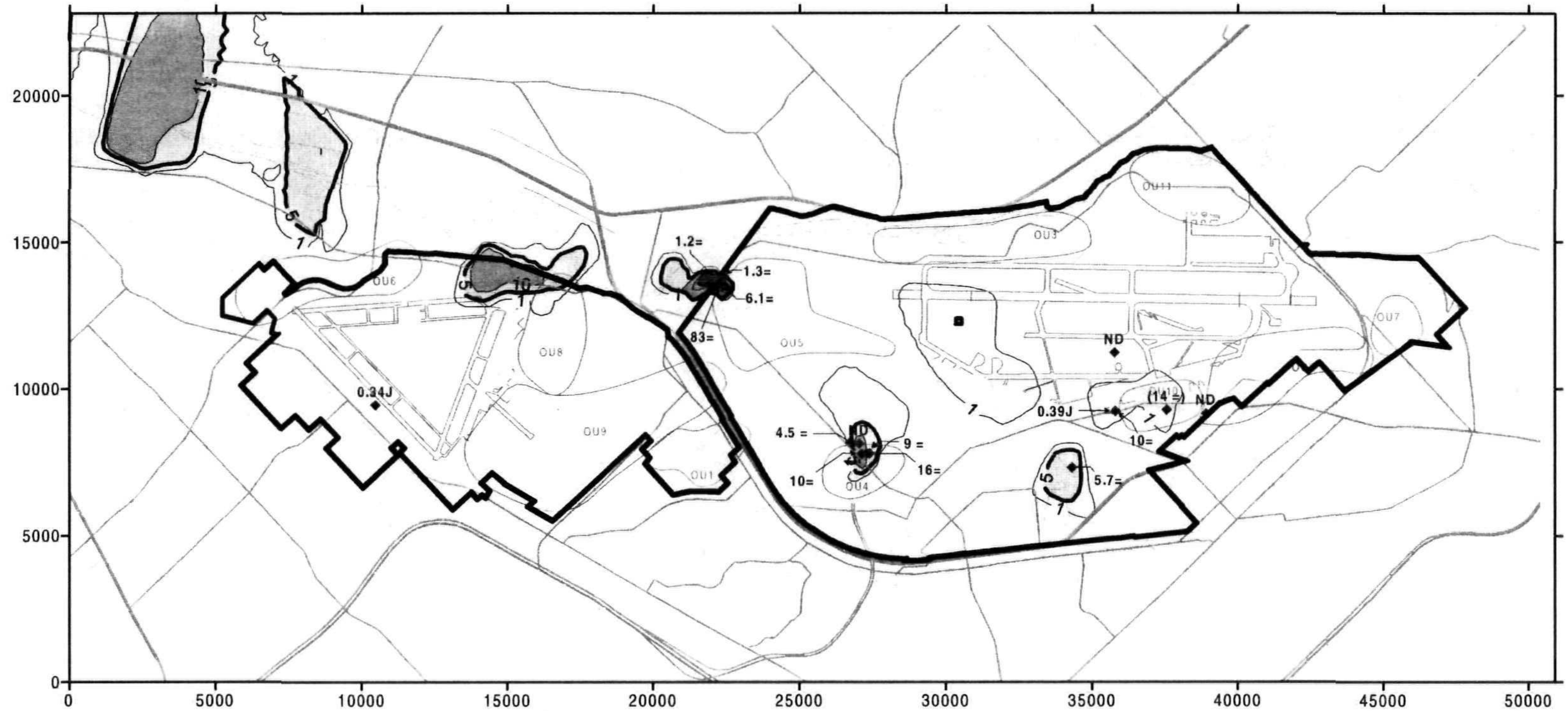
(ft)

IT

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	**Figure 7-4**
P/N:	**TCE in Layer 1 LTM Fall of 1998**
DATE: 02/22/99	
DWG NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct. '98 conc. in ug/L)
- Layer 2 Well (Oct. '98 conc. in ug/L)
- Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

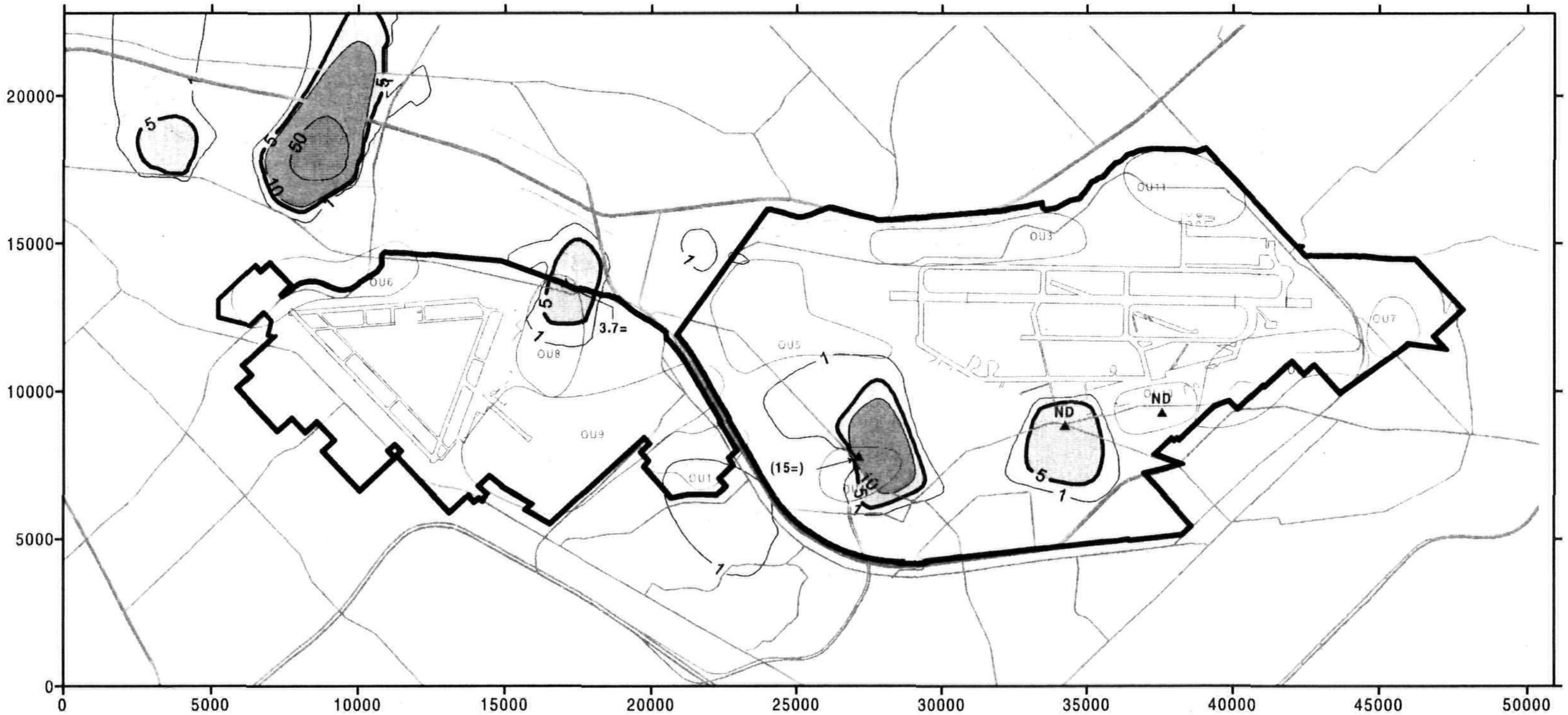
(ft)

IT

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	**Figure 7-5**
P/N:	**TCE in Layer 2 LTM Fall of 1998**
DATE: 02/23/99	
DWG. NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct. '98 conc. in ug/L)
- ◆ Layer 2 Well (Oct. '98 conc. in ug/L)
- ▲ Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

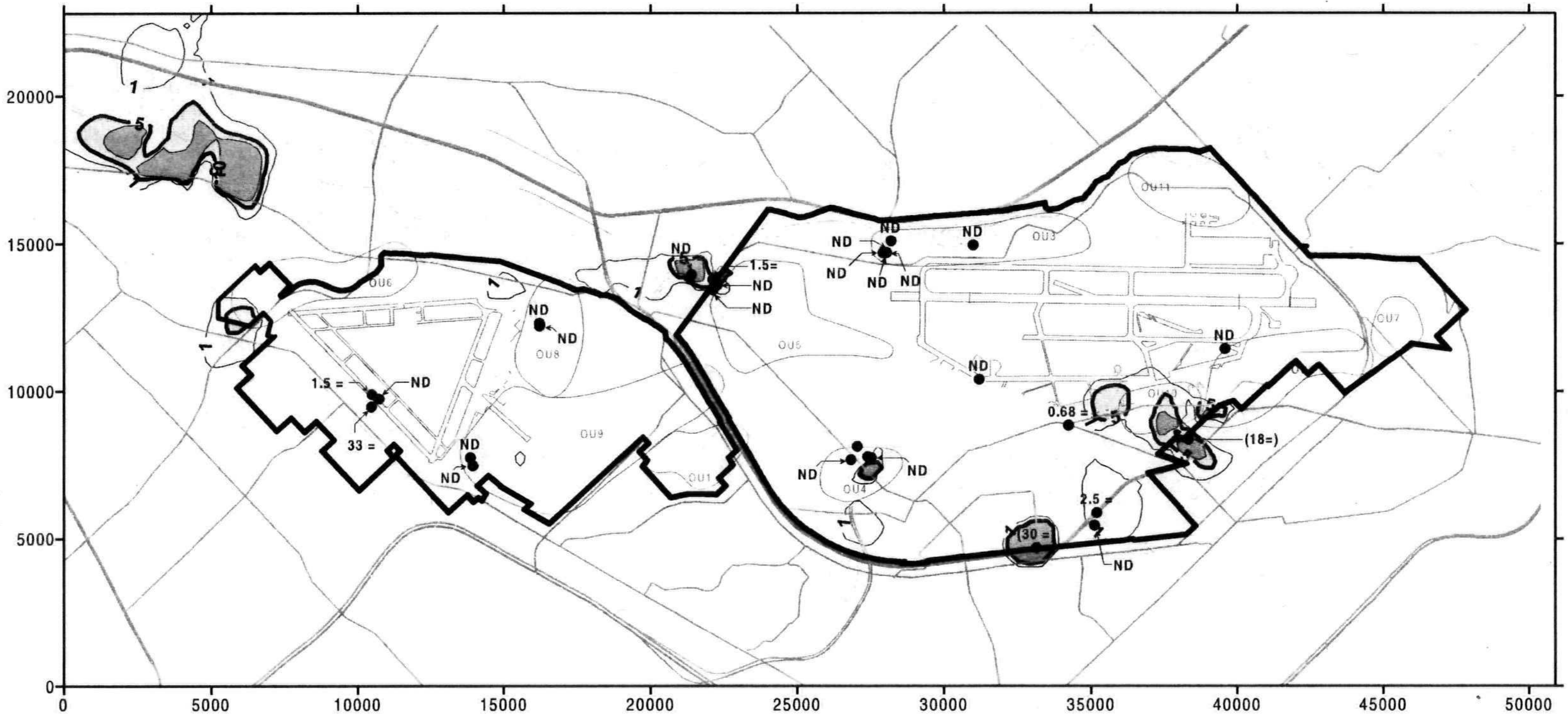
(ft)

IT

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	**Figure 7-6**
P/N:	**TCE in Layer 3 LTM Fall of 1998**
DATE: 02/22/99	
DWG NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct. '98 conc. in ug/L)
- ◆ Layer 2 Well (Oct. '98 conc. in ug/L)
- ▲ Layer 3 Well (Oct. '98 conc. in ug/L)

Note: Burial Sites 5 and 6 wells were installed in June 1997.

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

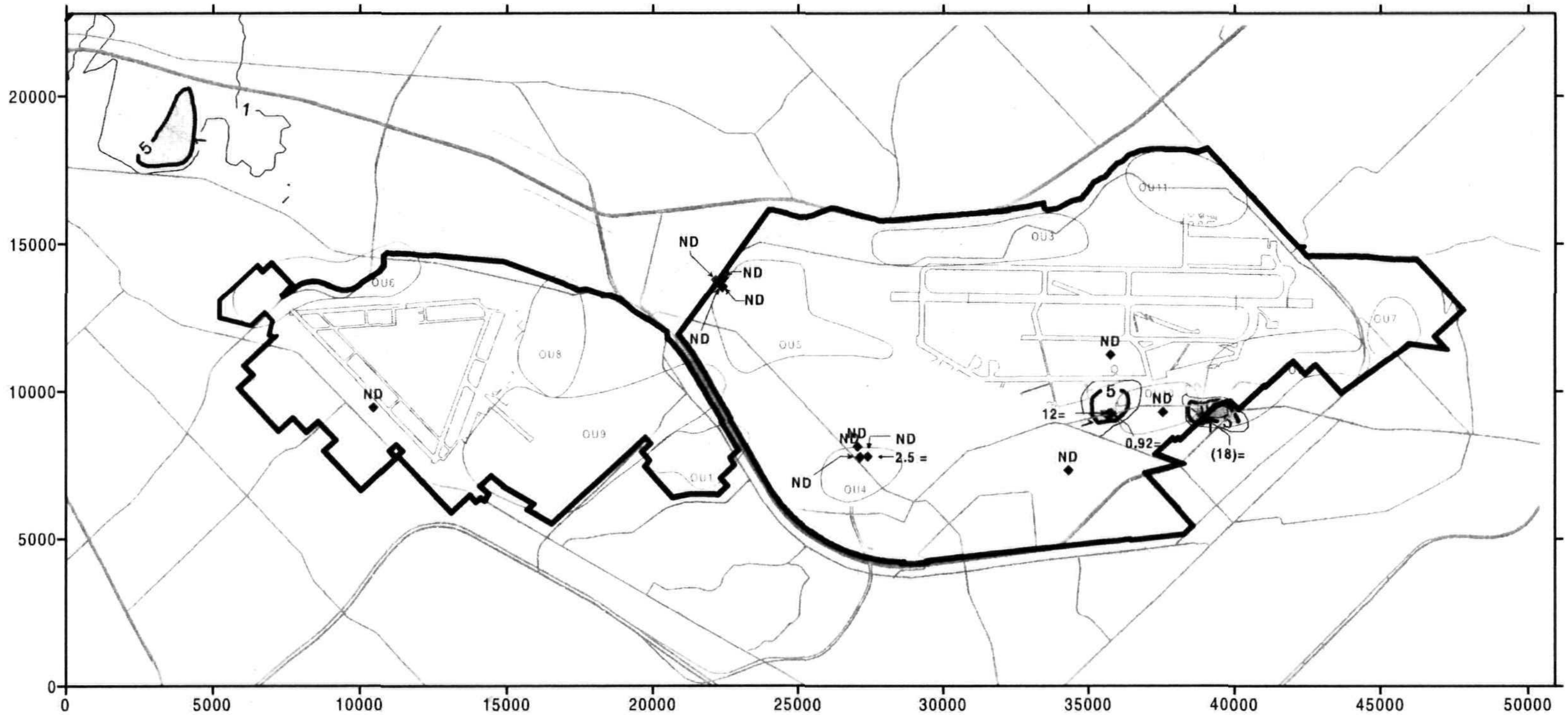
0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM CHECKED:	**Figure 7-7**
P/N:	**PCE in Layer 1 LTM Fall of 1998**
DATE: 02/22/99	
DWG. NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct. '98 conc. in ug/L)
- ◆ Layer 2 Well (Oct. '98 conc. in ug/L)
- ▲ Layer 3 Well (Oct. '98 conc. in ug/L)

Note: Burial Sites 5 and 6 wells were installed in June 1997.

Early 1990's conditions

1 5 10 50 100 1000

ug/l

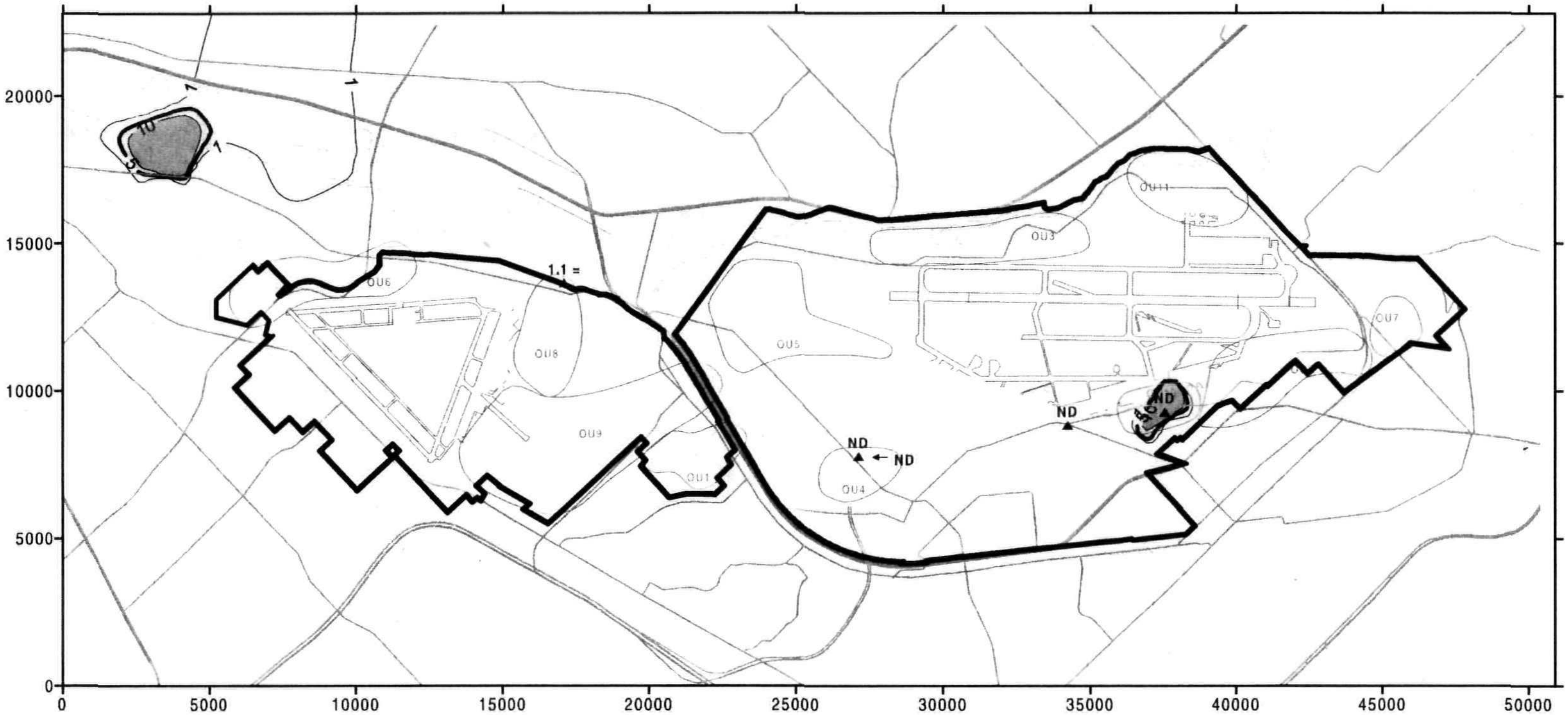
SCALE

0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION
11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	**Figure 7-8**
P/N:	**PCE in Layer 2 LTM Fall of 1998**
DATE: 02/22/99	
DWG. NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct. '98 conc. in ug/L)
- Layer 2 Well (Oct. '98 conc. in ug/L)
- Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

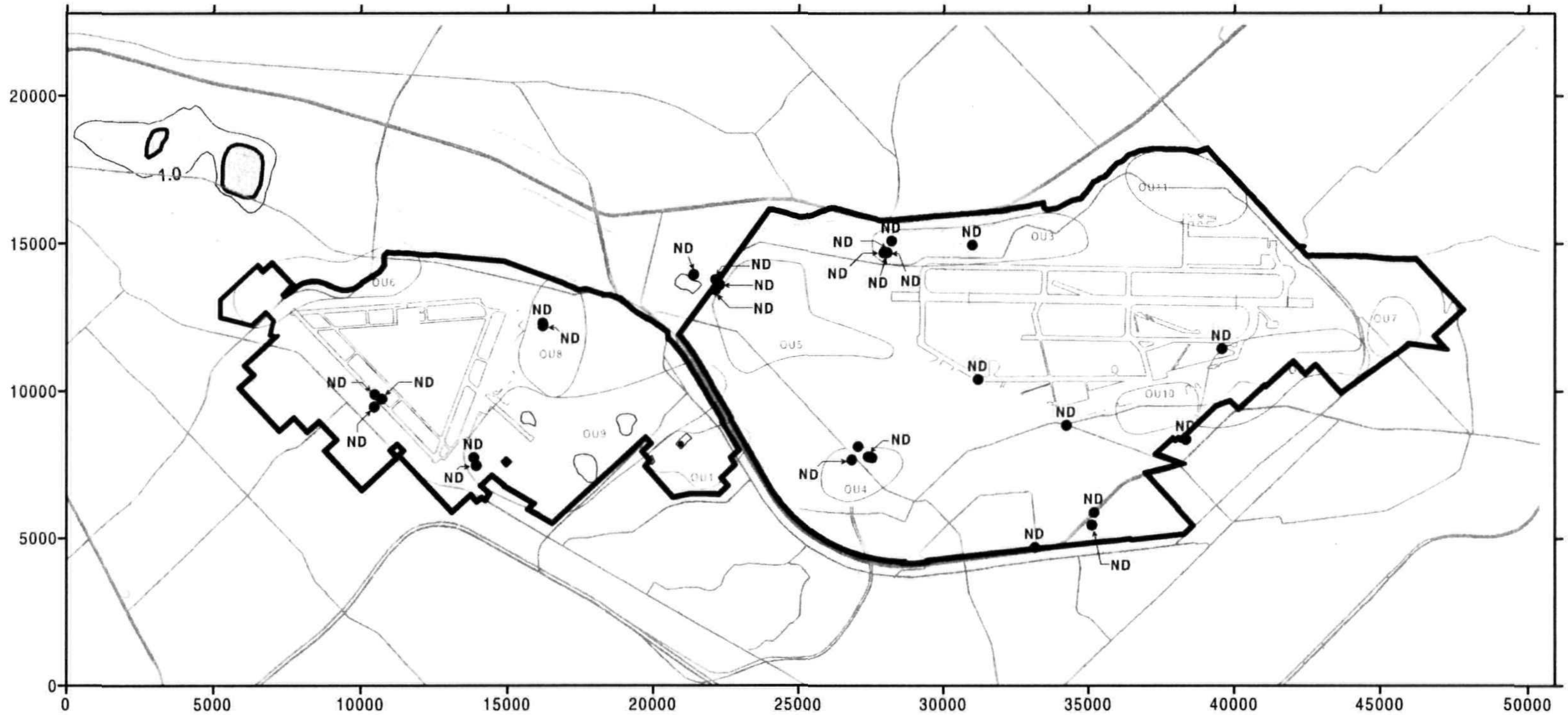
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft		SHEET NO.
DRAWN: JMM	CHECKED:	**Figure 7-9**
P/N:		**PCE in Layer 3 LTM Fall of 1998**
DATE: 02/22/99		
DWG. NO.		



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct. '98 conc. in ug/L)
- Layer 2 Well (Oct. '98 conc. in ug/L)
- Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION

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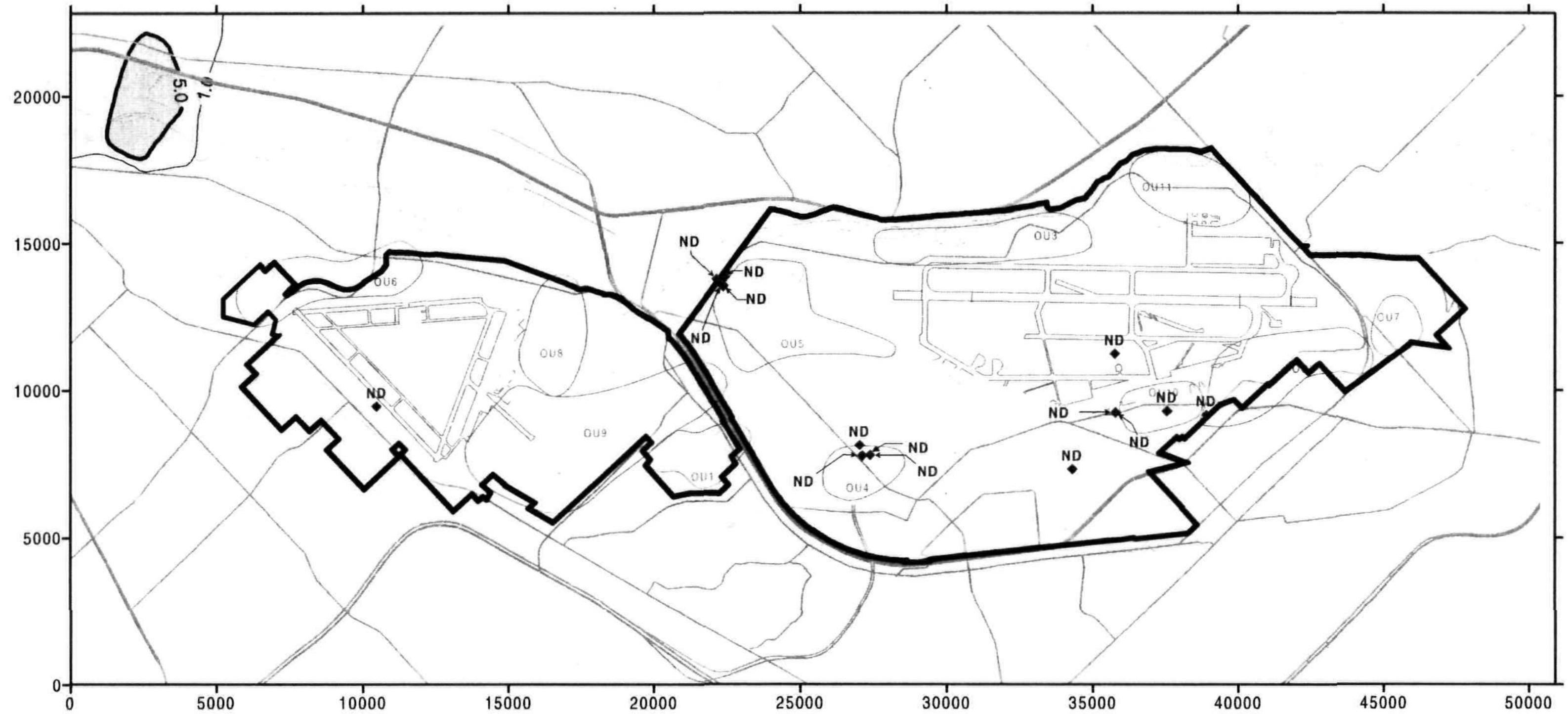
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	**Figure 7-10** **1,2-DCA in Layer 1 LTM Fall of 1998**
P/N:	
DATE: 02/22/99	
DWG NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct. '98 conc. in ug/L)
- ◆ Layer 2 Well (Oct. '98 conc. in ug/L)
- ▲ Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

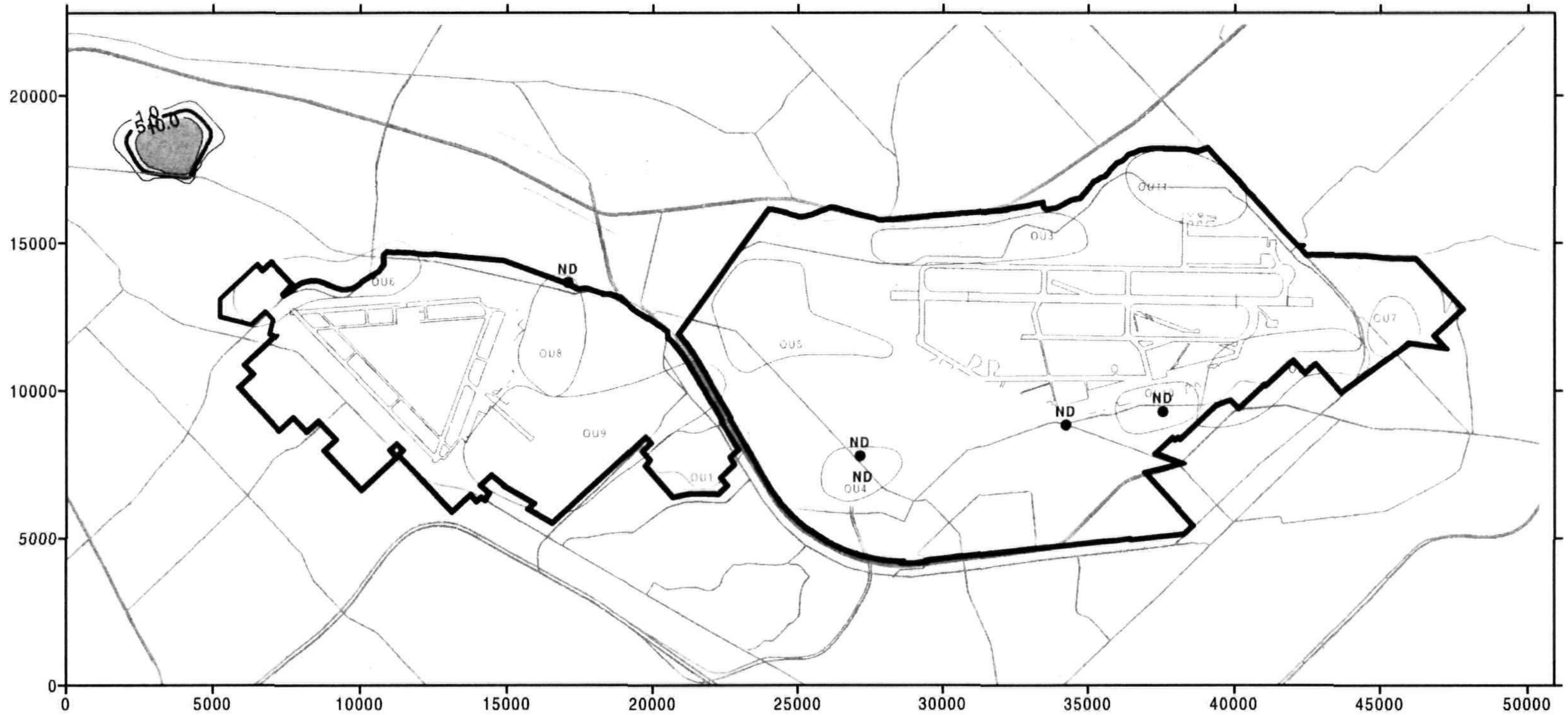
(ft)

IT

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO
DRAWN: JMM / CHECKED:	**Figure 7-11 1,2-DCA in Layer 2 LTM Fall of 1998**
P/N:	
DATE: 02/22/99	
DWG NO:	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct. '98 conc. in ug/L)
- ◆ Layer 2 Well (Oct. '98 conc. in ug/L)
- ▲ Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

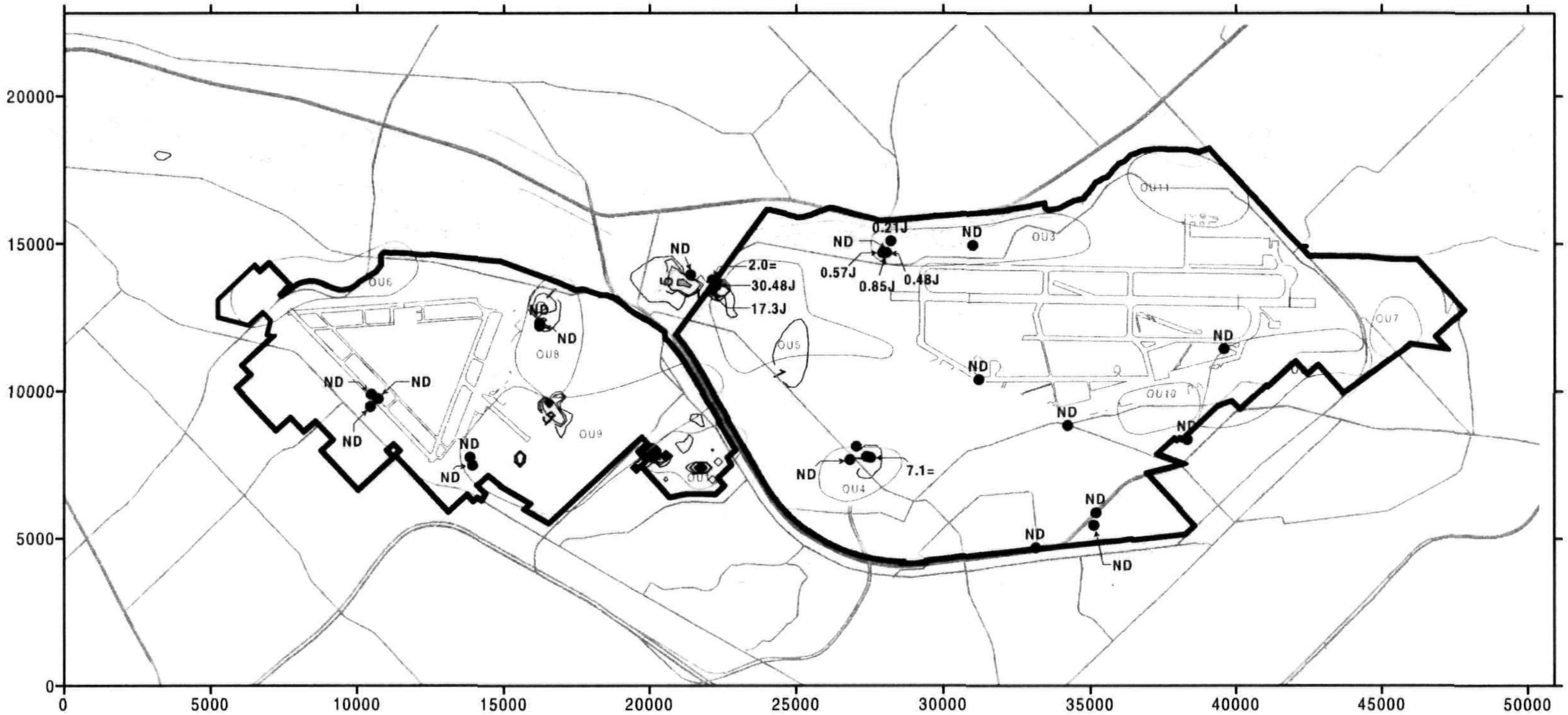
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM CHECKED:	**Figure 7-12 1,2-DCA in Layer 3 LTM Fall of 1998**
P/N:	
DATE: 02/22/99	
DWG. NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct. '98 conc. in ug/L)
- ◆ Layer 2 Well (Oct. '98 conc. in ug/L)
- ▲ Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 70 100

ug/l

SCALE

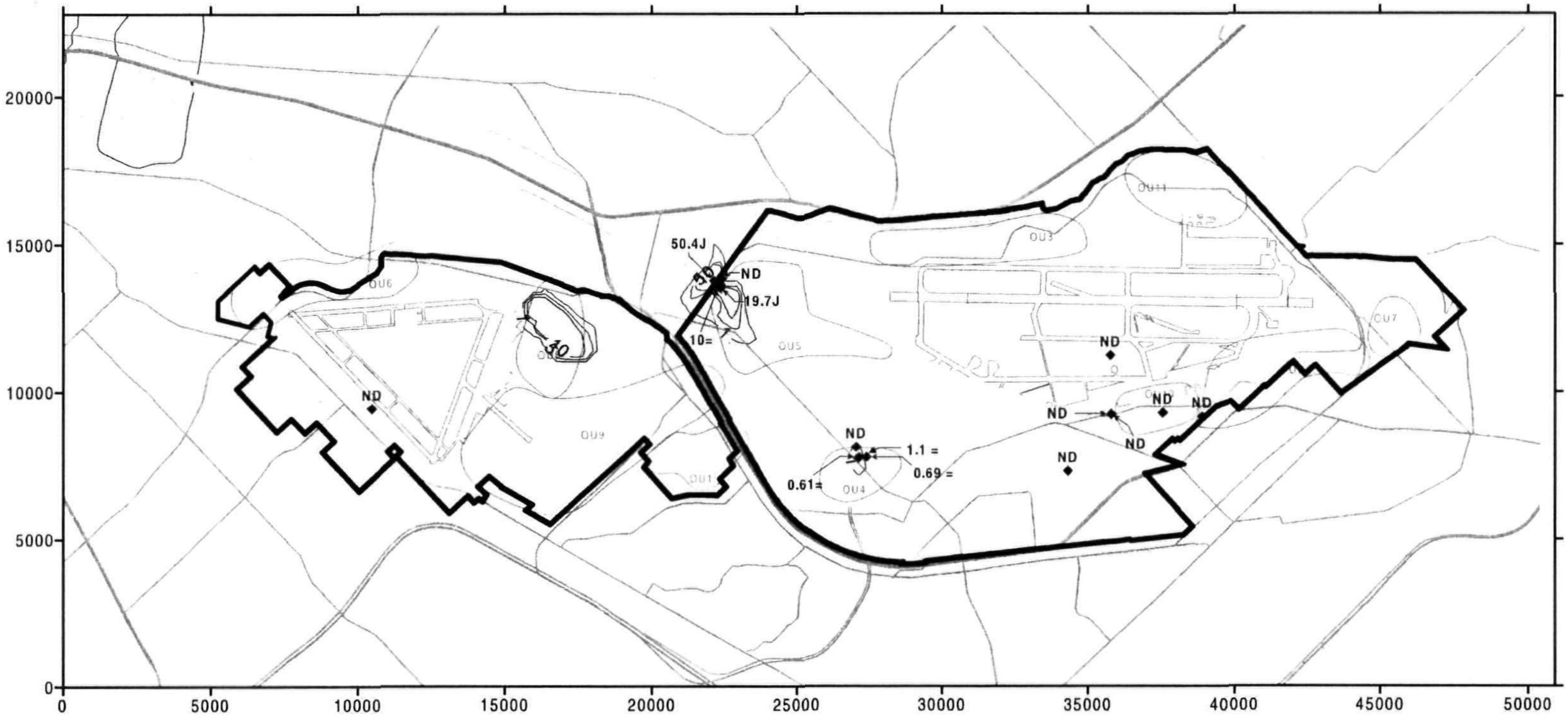
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft		SHEET NO.
DRAWN: JMM	CHECKED:	**Figure 7-13 1,2-DCE in Layer 1 LTM Fall of 1998**
P/N:		
DATE: 02/22/99		
DWG NO.		



LEGEND

Stream

Base Boundary

Roadways/Runways

Operable Unit (OU) Boundaries

● Layer 1 Well (Oct. '98 conc. in ug/L)

◆ Layer 2 Well (Oct. '98 conc. in ug/L)

▲ Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 70 100

ug/l

SCALE

0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION

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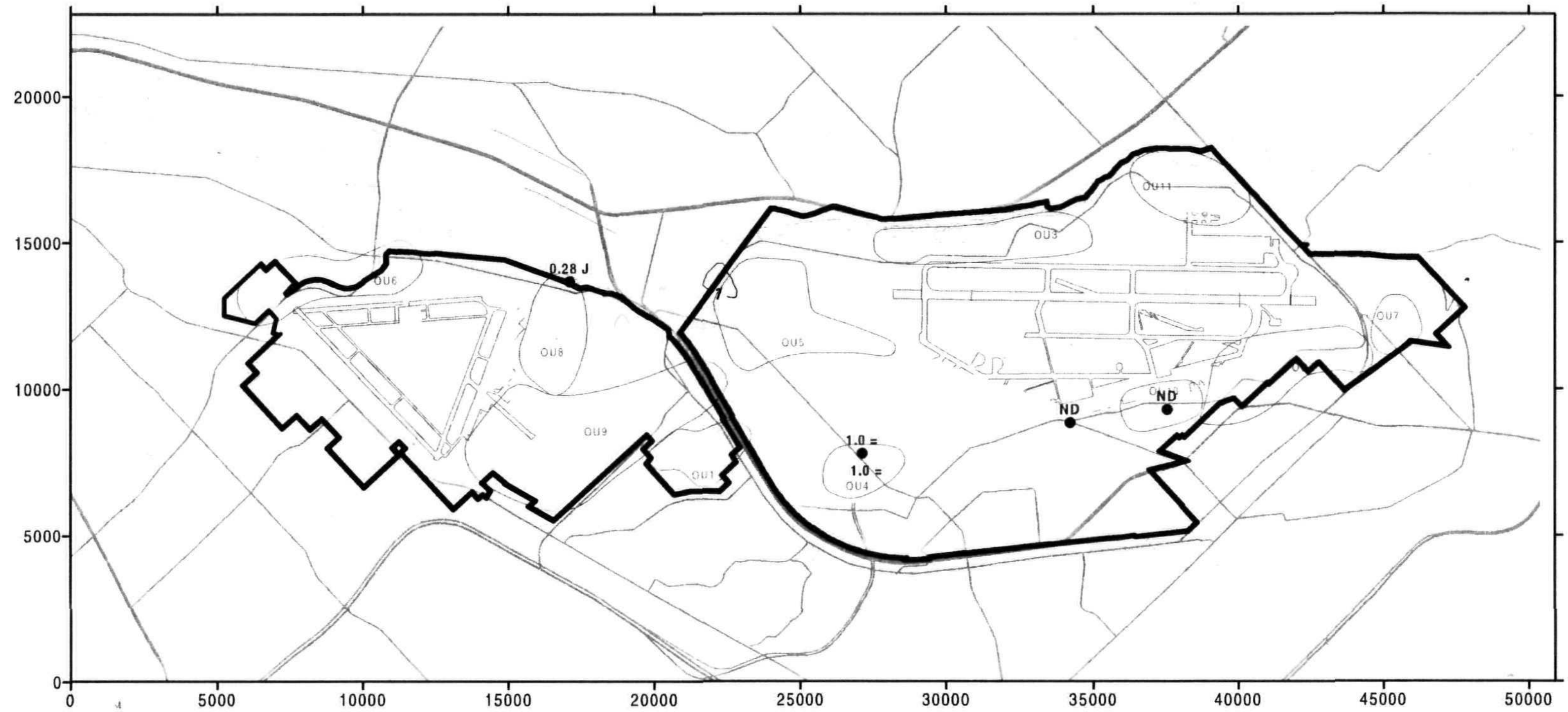
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	**Figure 7-14 1,2-DCE in Layer 2 LTM Fall of 1998**
P/N:	
DATE: 02/22/99	
DWG. NO.	



LEGEND

Stream
Base Boundary
Roadways/Runways
Operable Unit (OU) Boundaries
Layer 1 Well (Oct. '98 conc. in ug/L)
Layer 2 Well (Oct. '98 conc. in ug/L)
Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 70 100

ug/l

SCALE

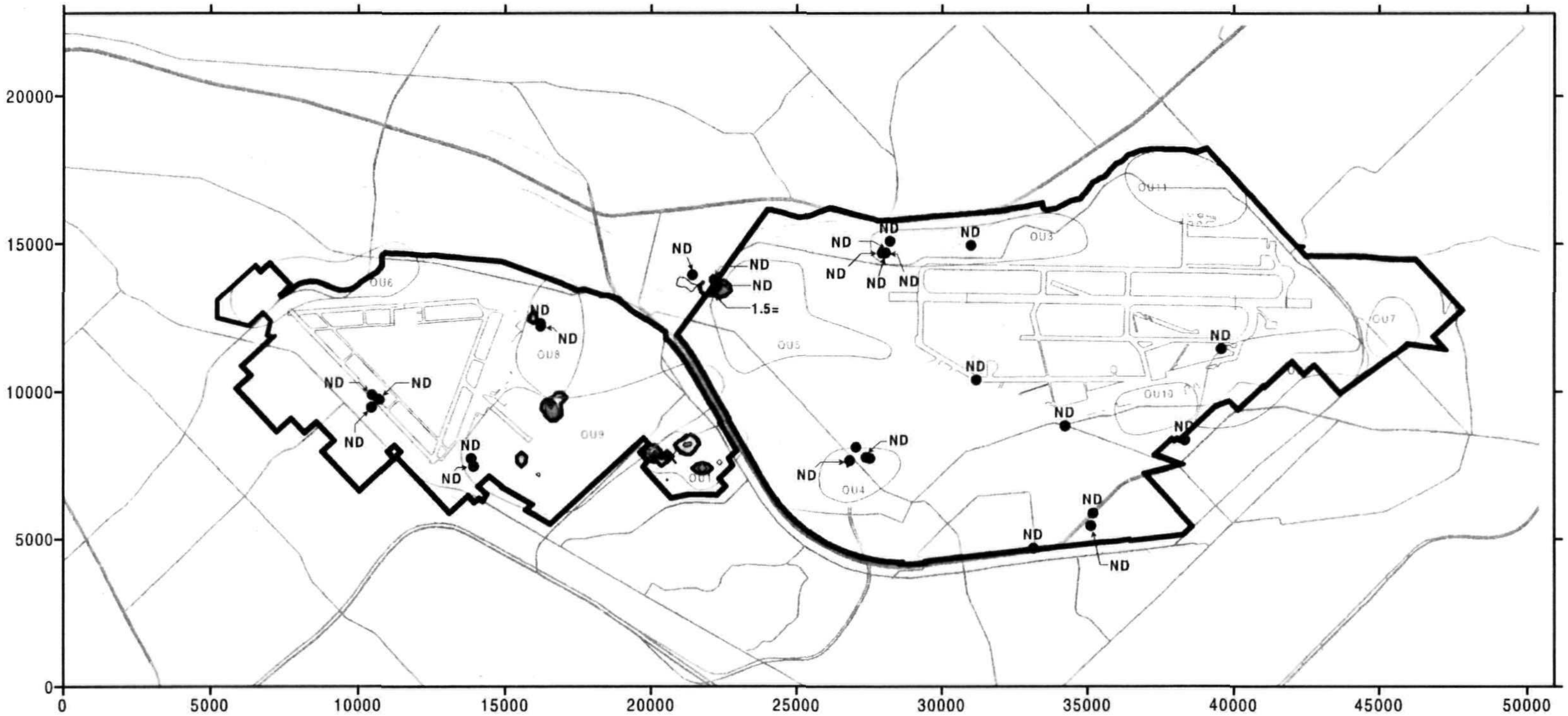
0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION
11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft
DRAWN: JMM
CHECKED:
P/N:
DATE: 02/22/99
DWG NO.
SHEET NO.

Figure 7-15
1,2-DCE in Layer 3 LTM
Fall of 1998



LEGEND

Stream
Base Boundary
Roadways/Runways
Operable Unit (OU) Boundaries
Layer 1 Well (Oct. '98 conc. in ug/L)
Layer 2 Well (Oct. '98 conc. in ug/L)
Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 2 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft

DRAWN: JMM

CHECKED:

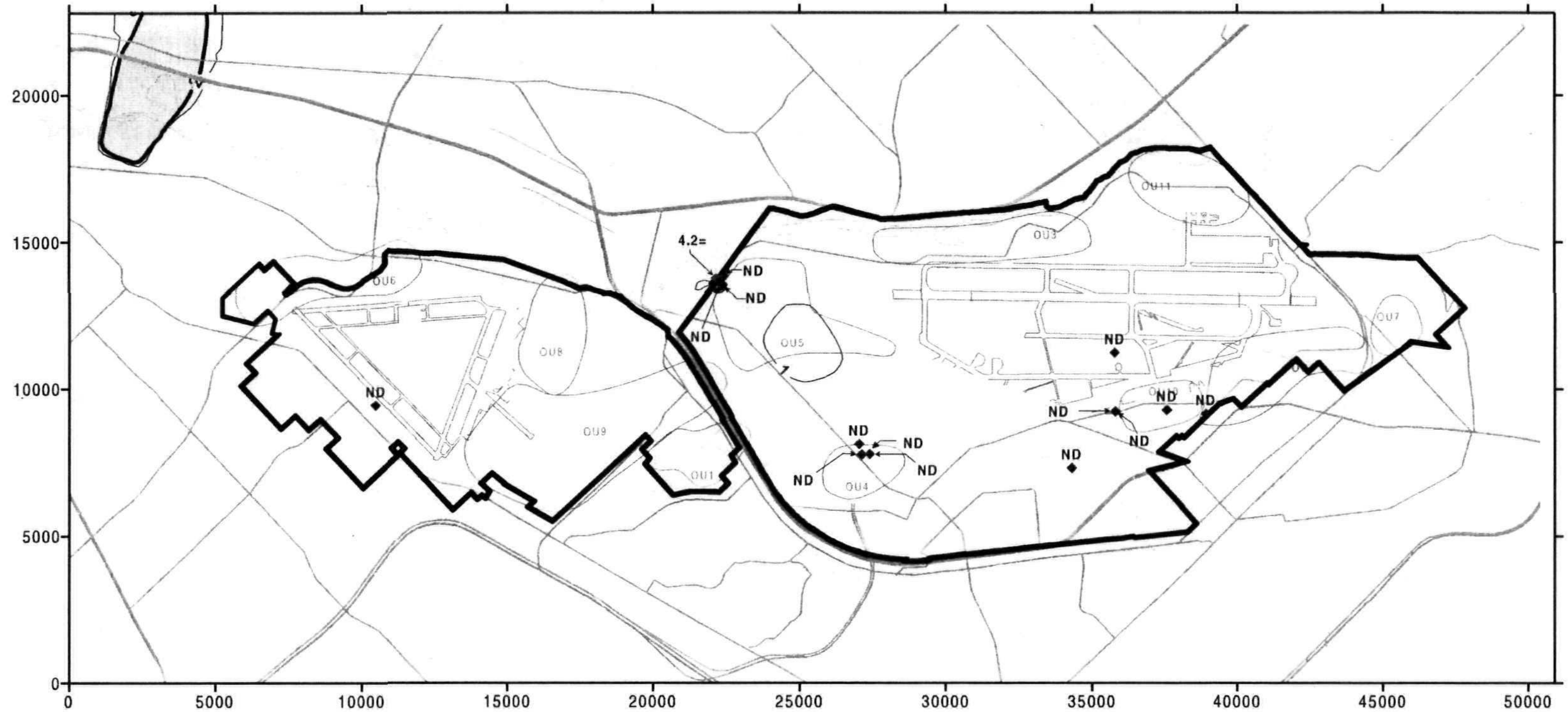
P/N:

DATE: 02/22/99

DWG NO:

SHEET NO

Figure 7-16
Vinyl Chloride in Layer 1
LTM
Fall of 1998



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct. '98 conc. in ug/L)
- ◆ Layer 2 Well (Oct. '98 conc. in ug/L)
- ▲ Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 2 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

(ft)

IT

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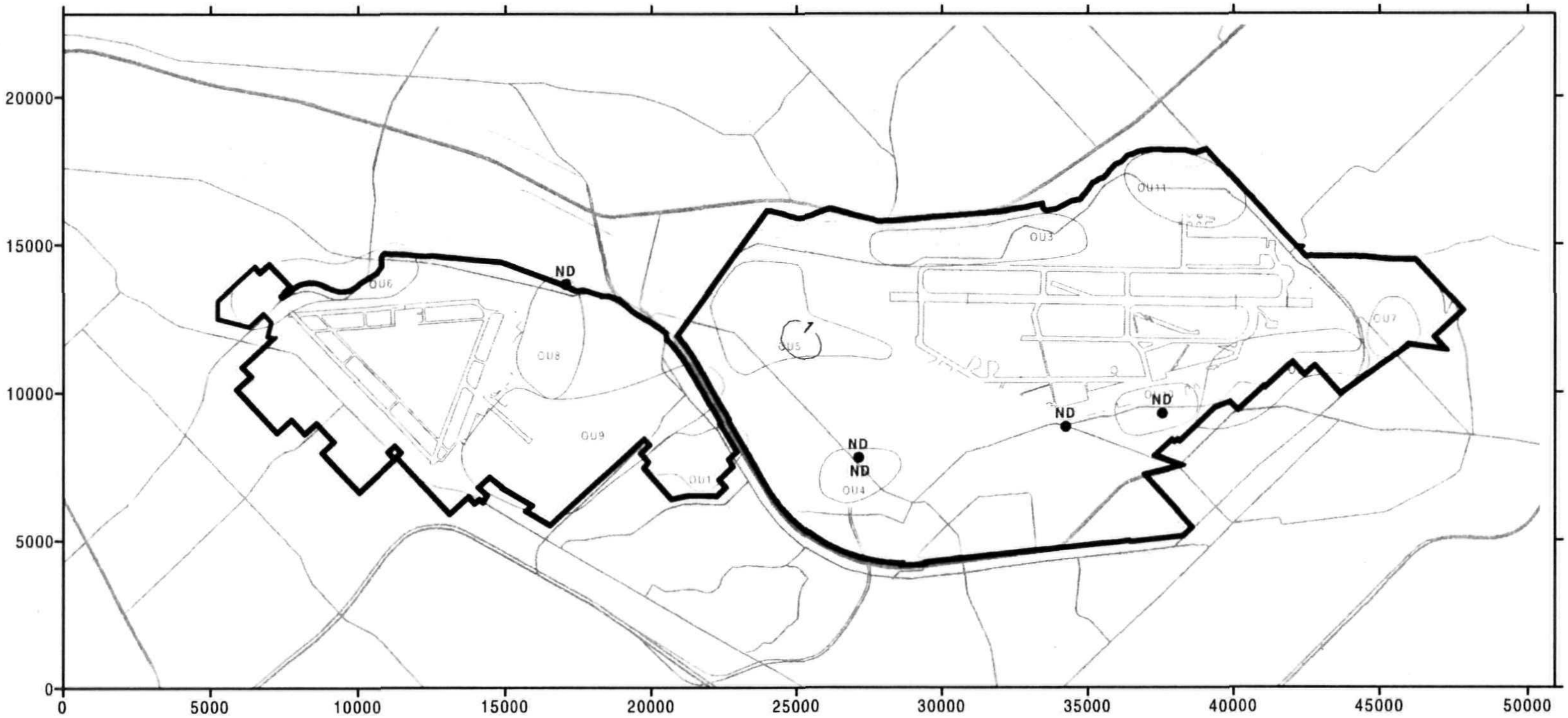
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	**Figure 7-17 Vinyl Chloride in Layer 2 LTM Fall of 1998**
P/N:	
DATE: 02/22/99	
DWG. NO.	



LEGEND

Stream
Base Boundary
Roadways/Runways
Operable Unit (OU) Boundaries
Layer 1 Well (Oct. '98 conc. in ug/L)
Layer 2 Well (Oct. '98 conc. in ug/L)
Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 2 10 50 100 1000

ug/l

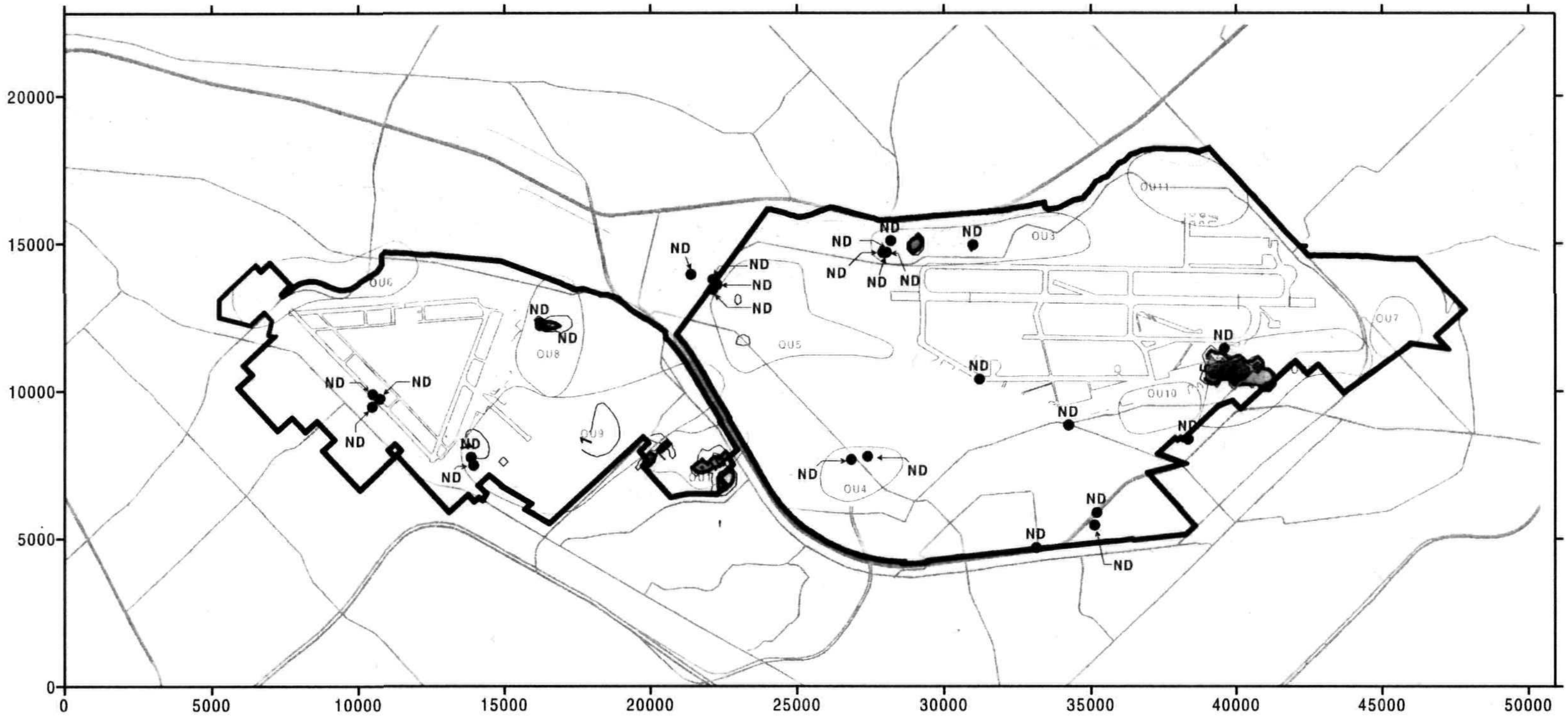
SCALE

0 2000 4000 6000 8000

(ft)

IT
IT CORPORATION
11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	**Figure 7-18 Vinyl Chloride in Layer 3 LTM Fall of 1998**
P/N:	
DATE: 02/22/99	
DWG. NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- ● Layer 1 Well (Oct. '98 conc. in ug/L)
- ◆ Layer 2 Well (Oct. '98 conc. in ug/L)
- ▲ Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

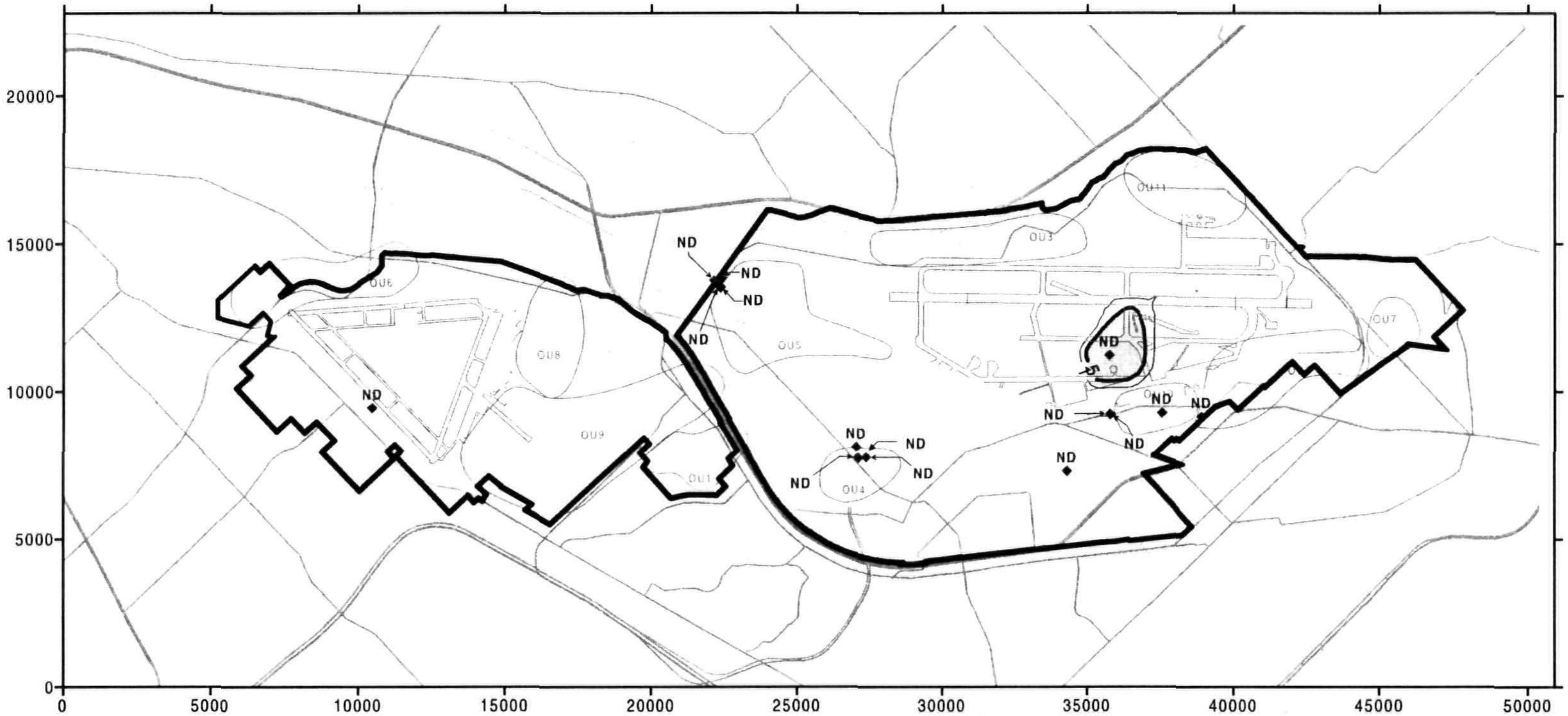
0 2000 4000 6000 8000

(ft)

IT CORPORATION

11499 CHESTER ROAD
CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft		SHEET NO.
DRAWN: JMM	CHECKED:	**Figure 7-19**
P/N:		**Benzene in Layer 1 LTM Fall of 1998**
DATE: 02/22/99		
DWG. NO.		



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct. '98 conc. in ug/L)
- Layer 2 Well (Oct. '98 conc. in ug/L)
- Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

(ft)

IT

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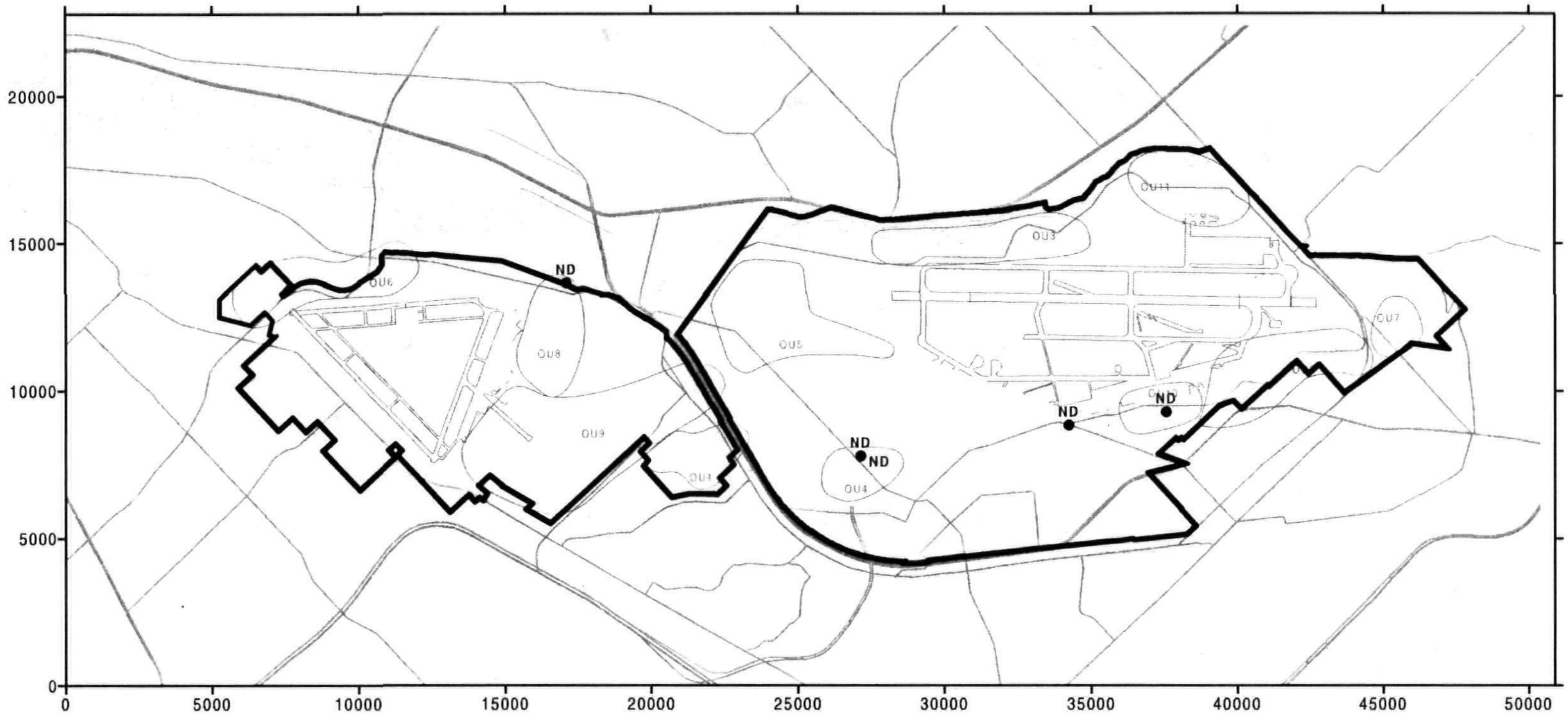
SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM / CHECKED:	Figure 7-20
P/N:	Benzene in Layer 2 LTM Fall of 1998
DATE: 02/22/99	
DWG. NO.	



LEGEND

- Stream
- Base Boundary
- Roadways/Runways
- Operable Unit (OU) Boundaries
- Layer 1 Well (Oct. '98 conc. in ug/L)
- Layer 2 Well (Oct. '98 conc. in ug/L)
- Layer 3 Well (Oct. '98 conc. in ug/L)

Early 1990's conditions

1 5 10 50 100 1000

ug/l

SCALE

0 2000 4000 6000 8000

(ft)

IT CORPORATION
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CINCINNATI, OHIO 45246

SCALE: 1" = 4,000 ft	SHEET NO.
DRAWN: JMM CHECKED:	**Figure 7-21**
P/N:	**Bezene in Layer 3 LTM Fall of 1998**
DATE: 02/22/99	
DWG NO.	